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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

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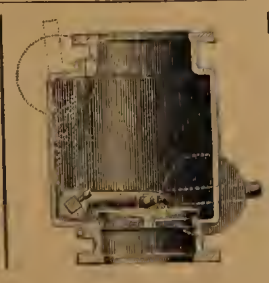
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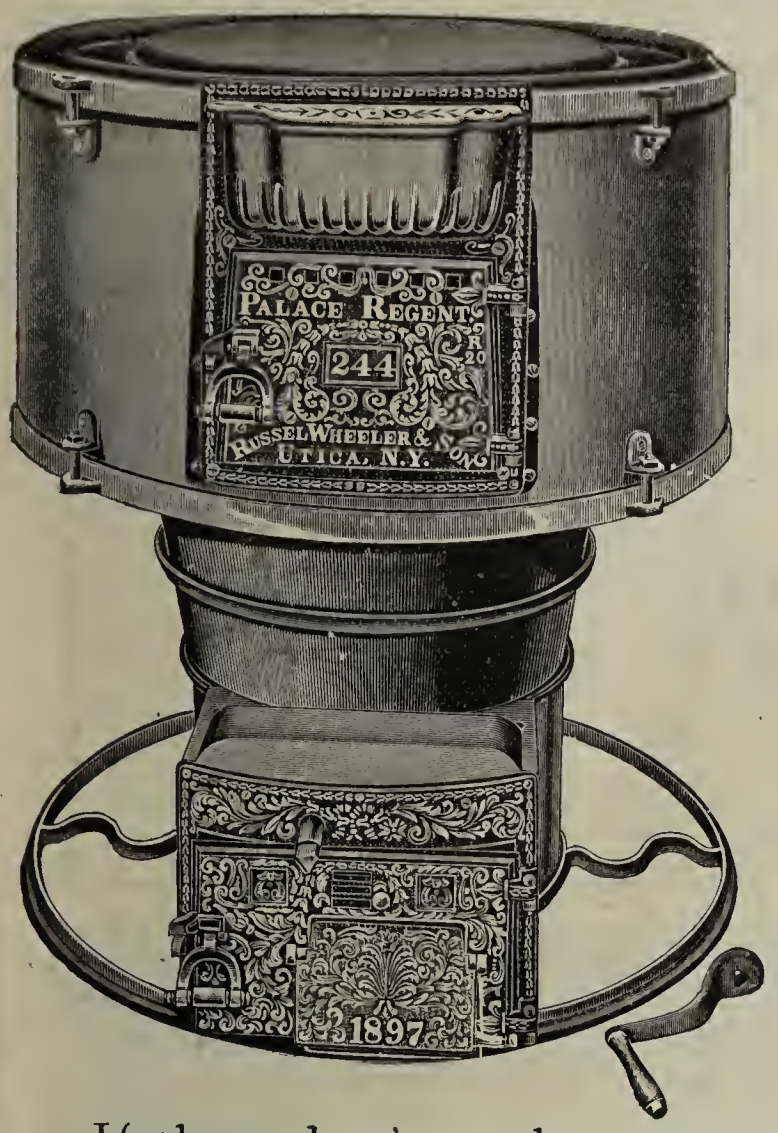
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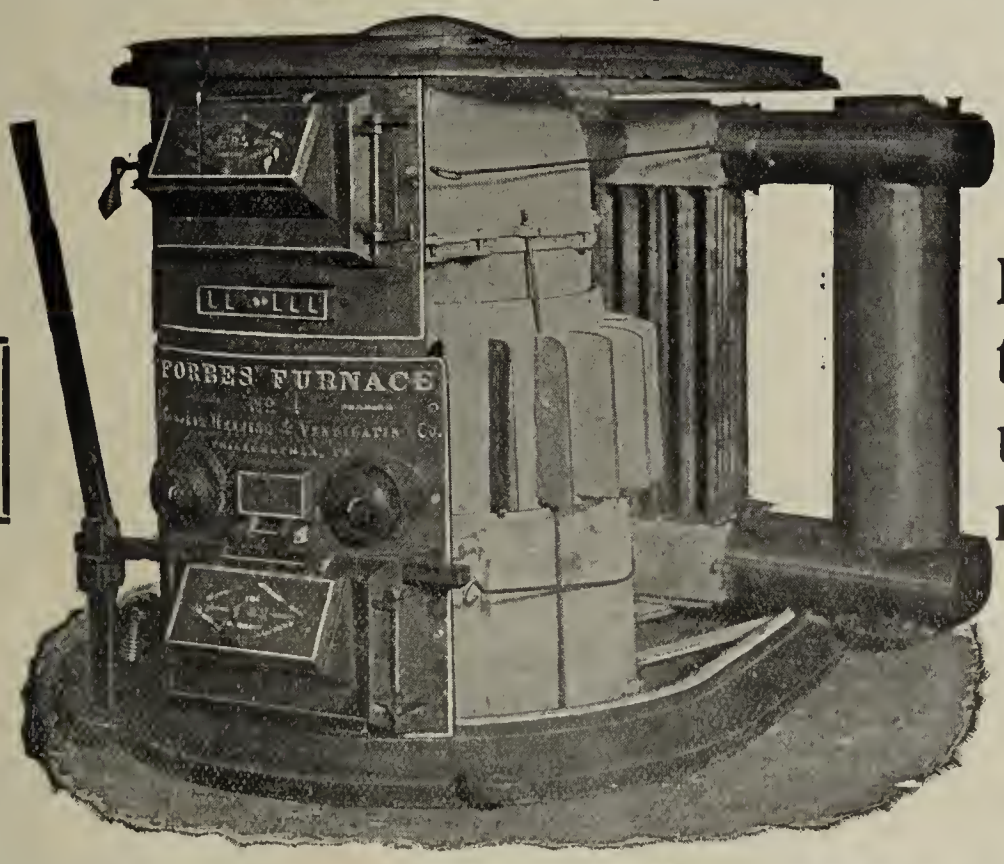
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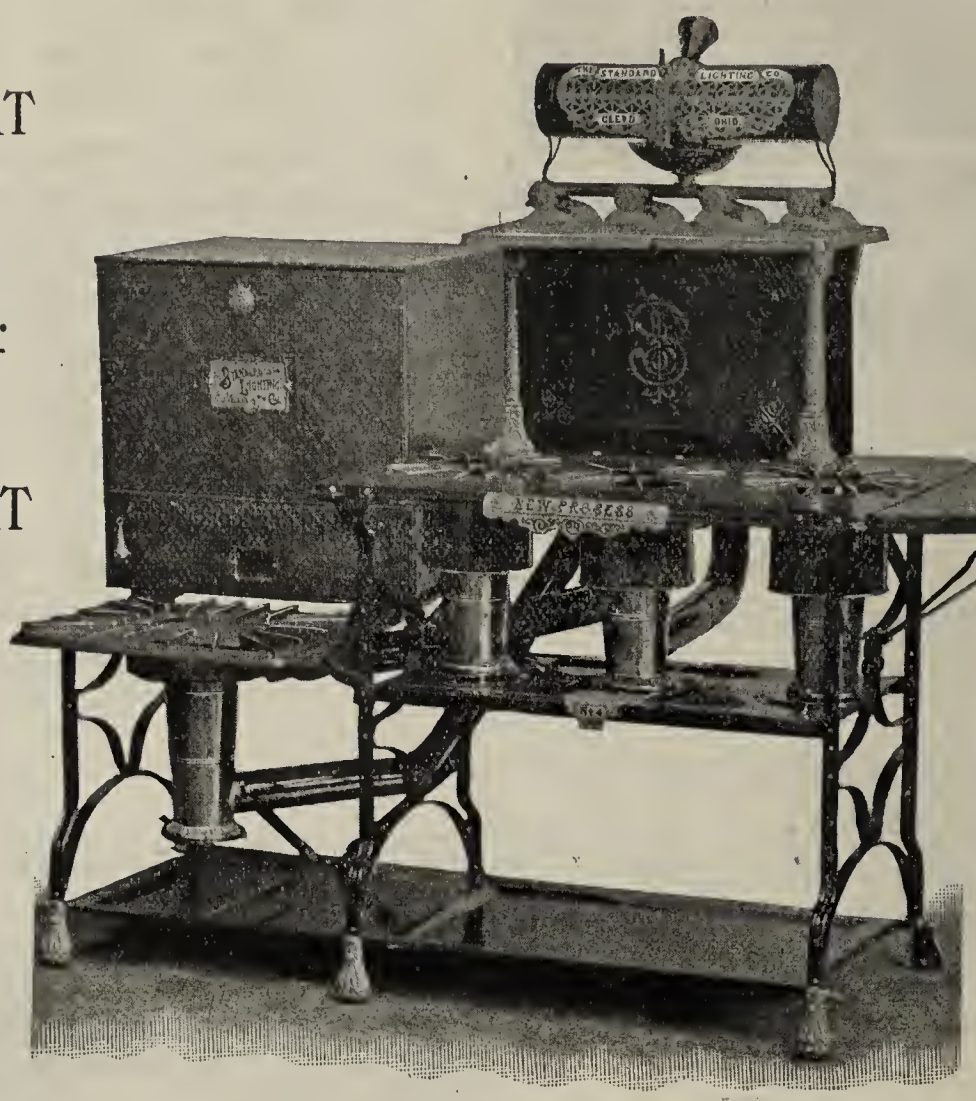
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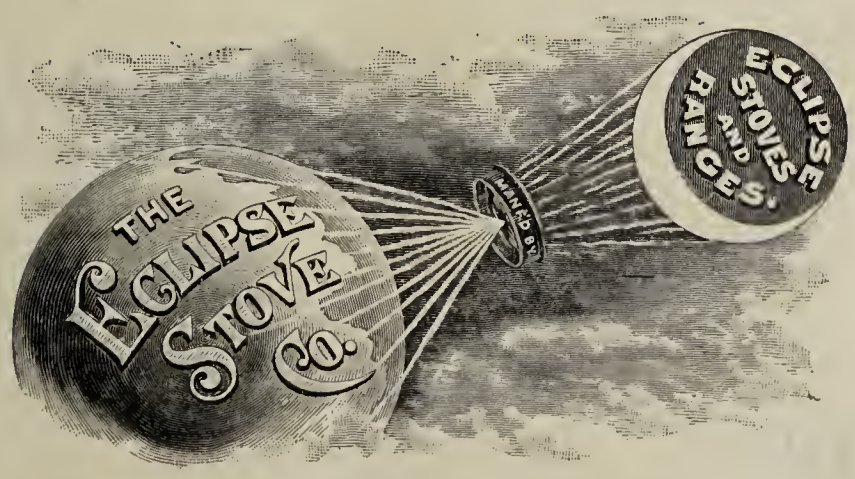
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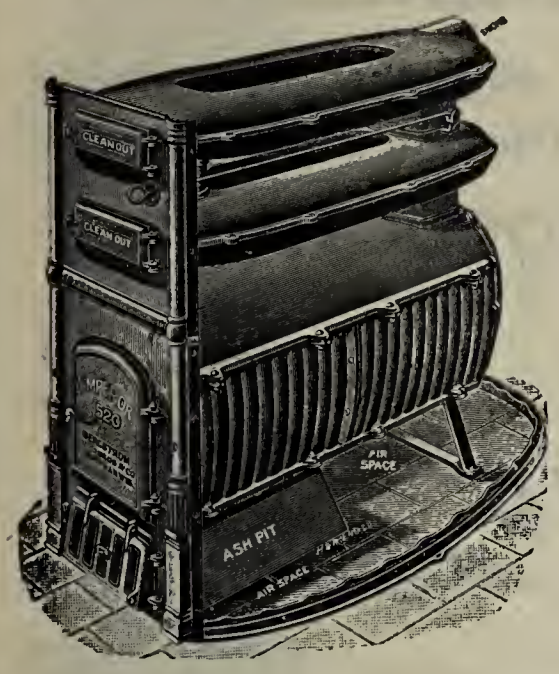
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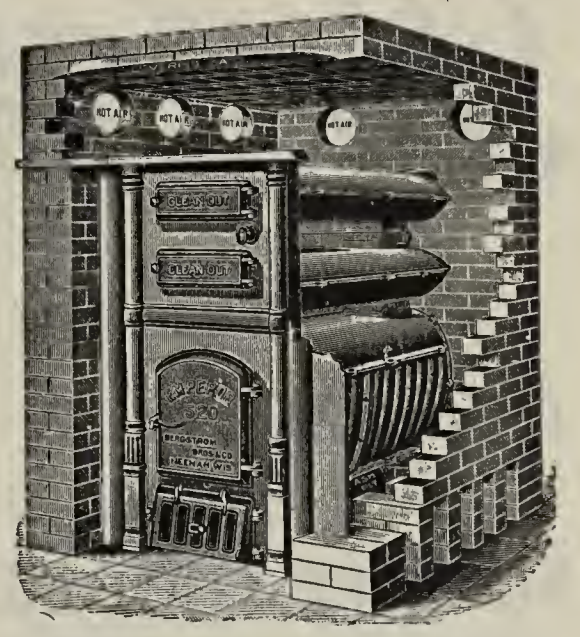
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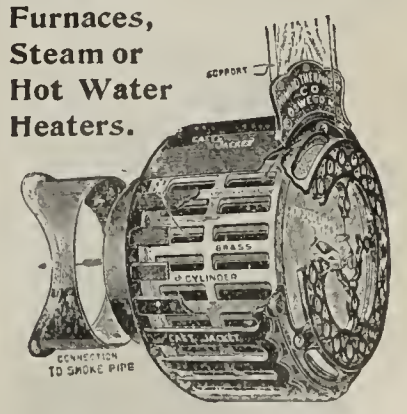
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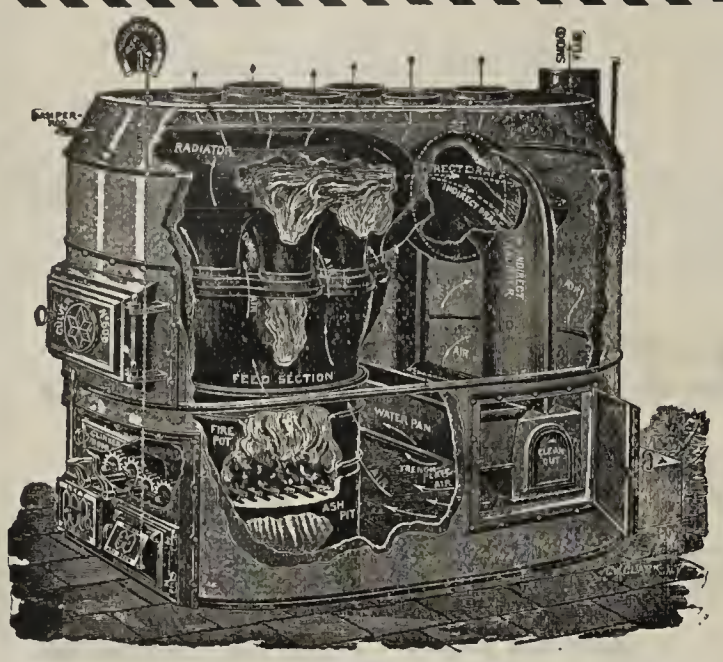
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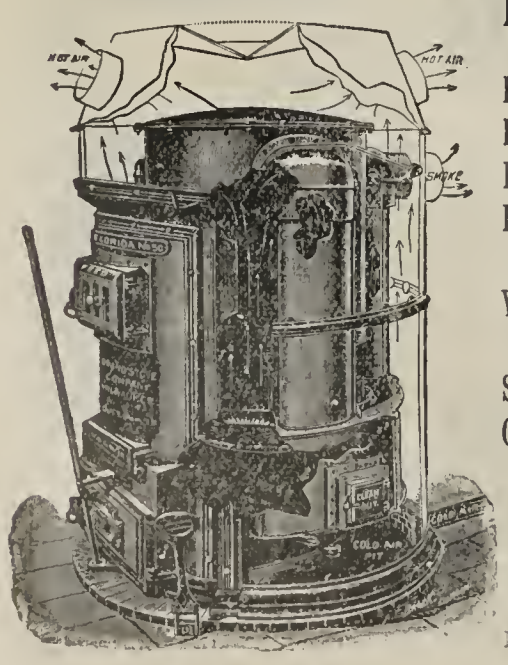
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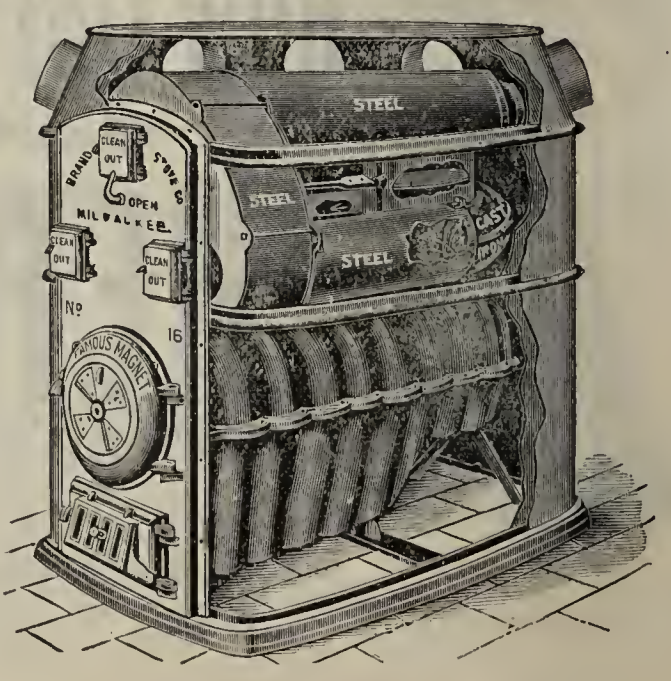
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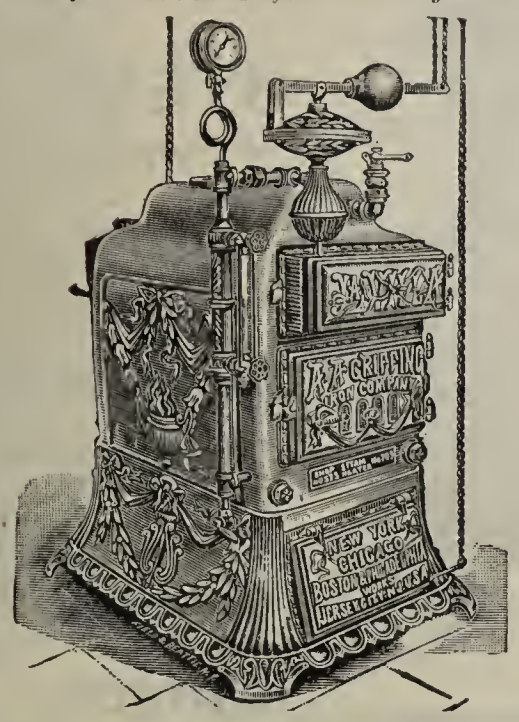
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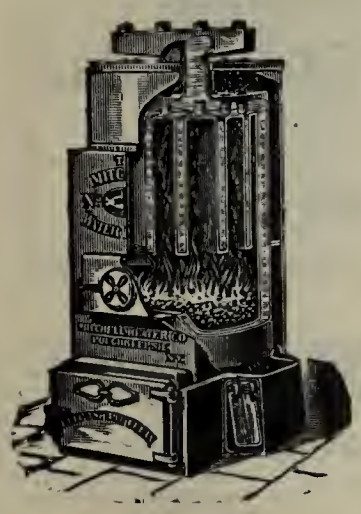
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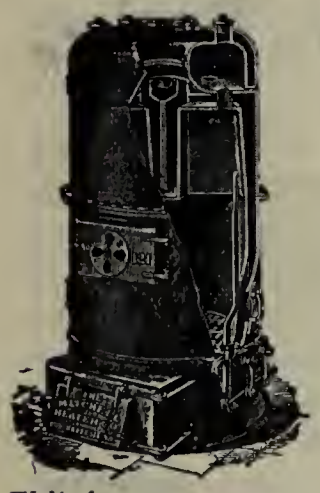
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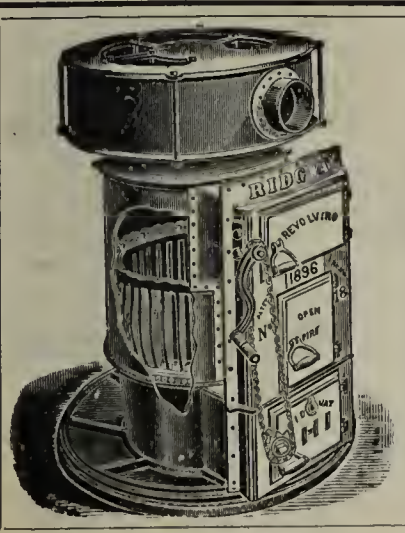


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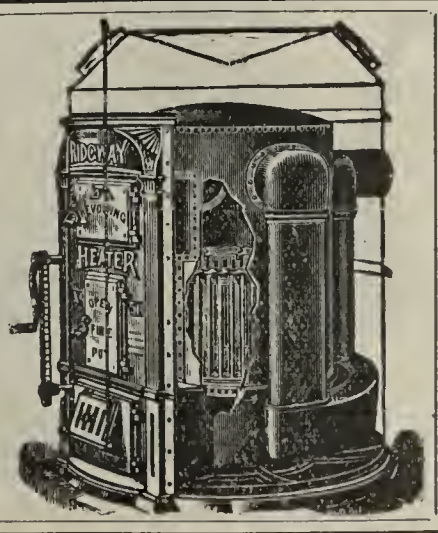


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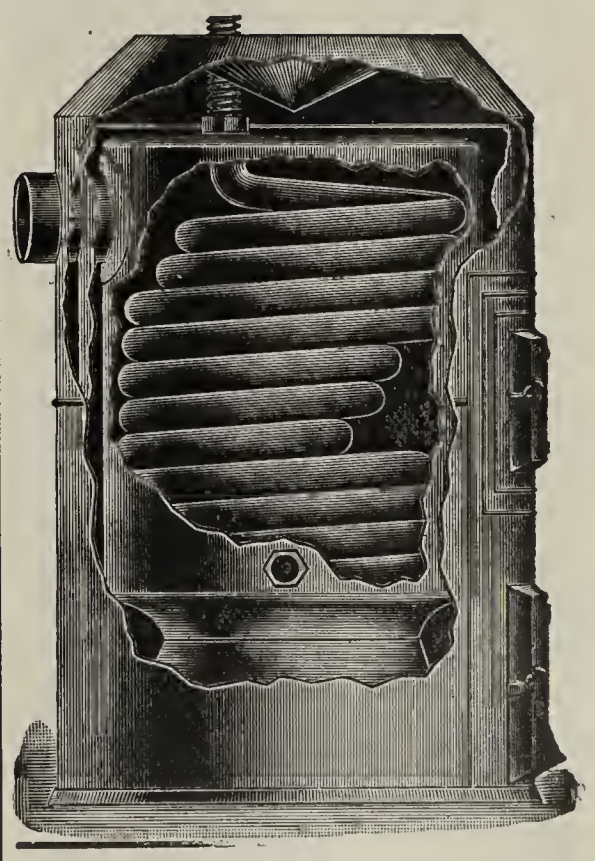


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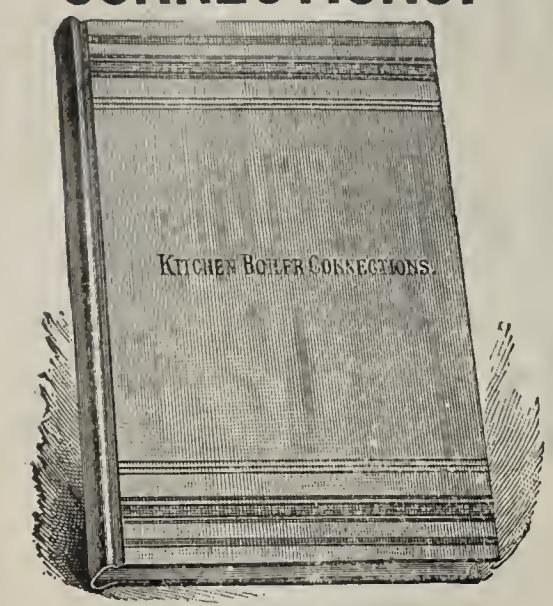
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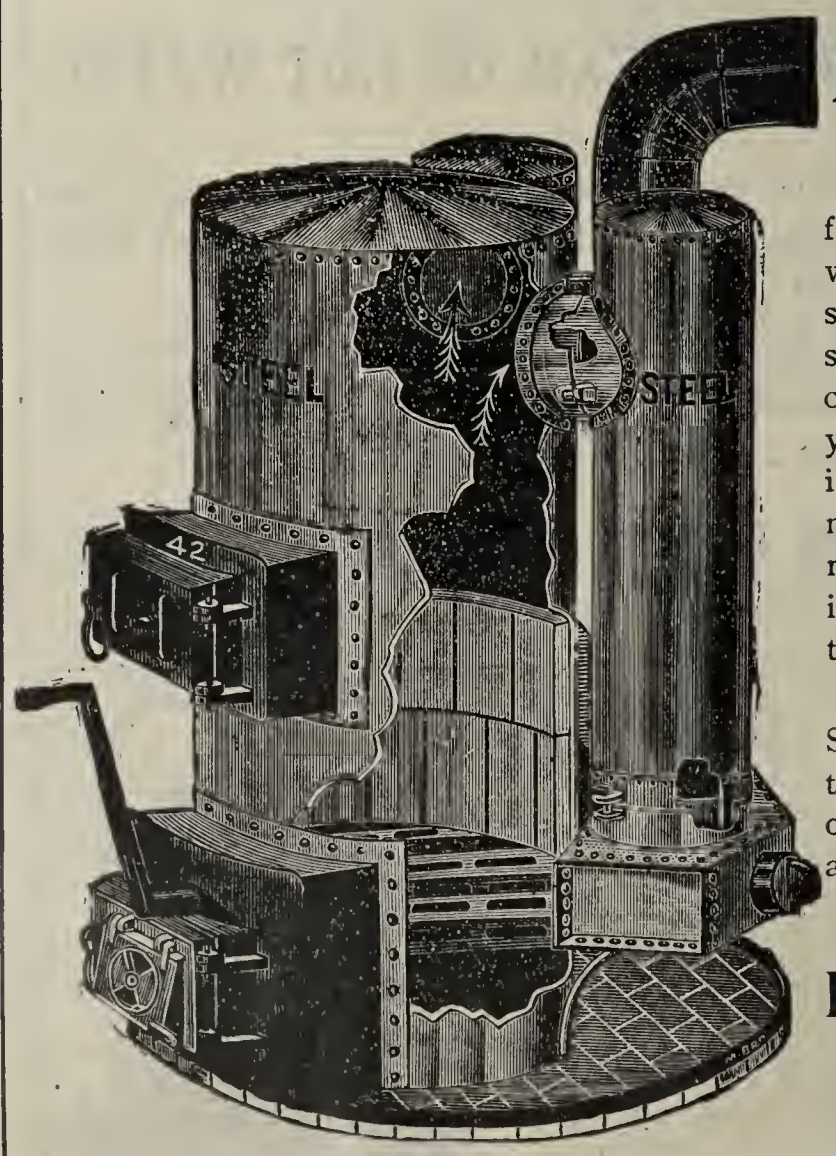


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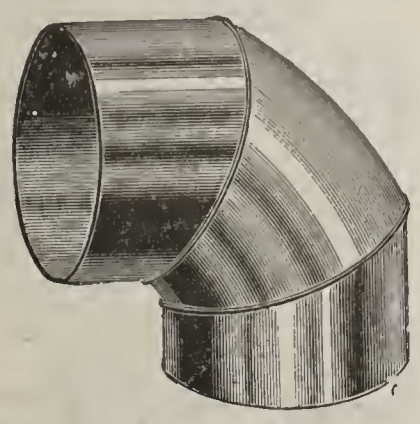
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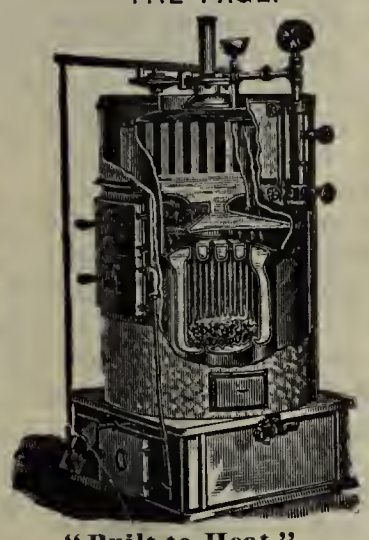
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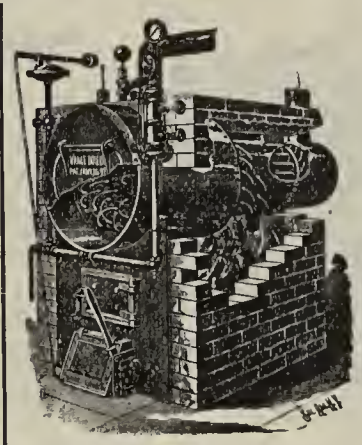
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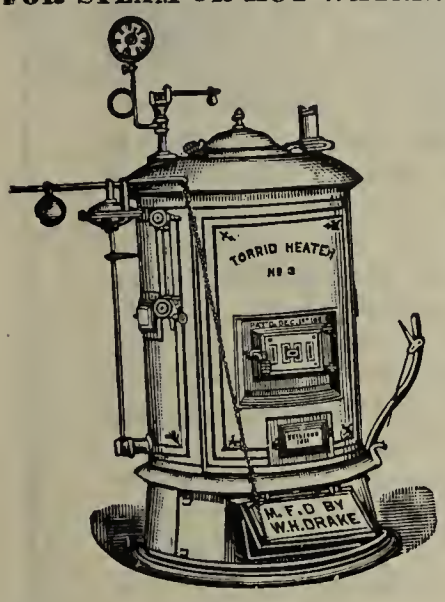
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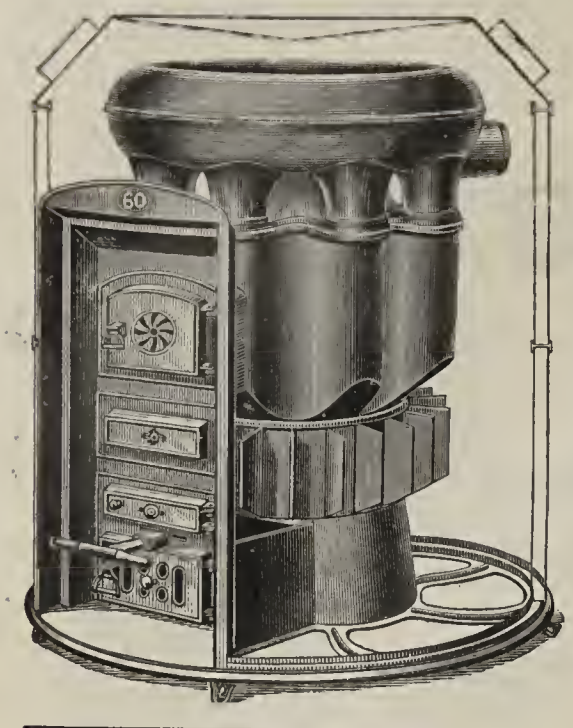
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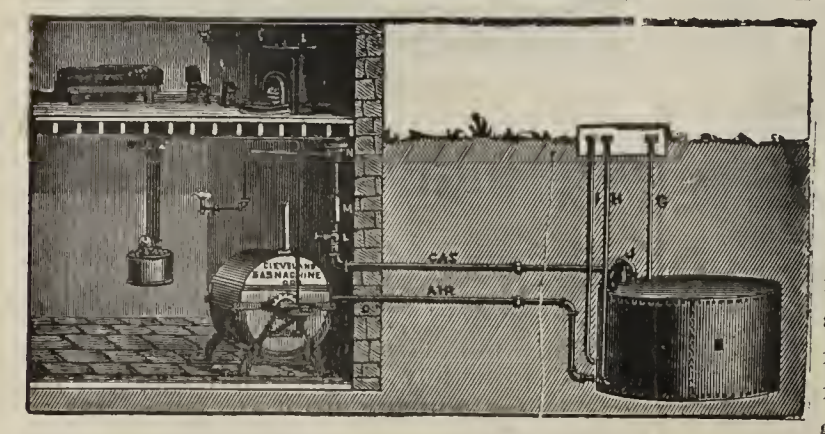
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Plans of various systems are given and a full account of all the details of a successful heating job.

CONTENTS.

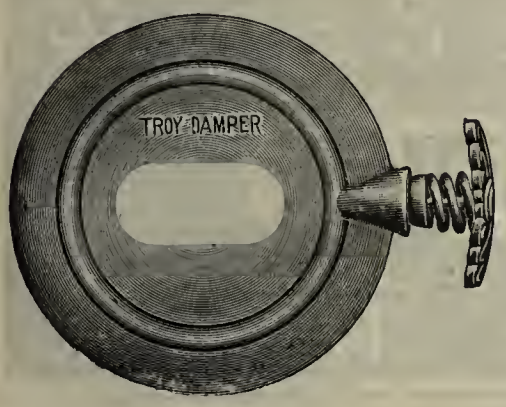
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" 2. General Questions on Heating.
" 3. Low Pressure Steam.
" 4. Two-Pipe Steam Heating.
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" 6. Indirect Steam Heating.
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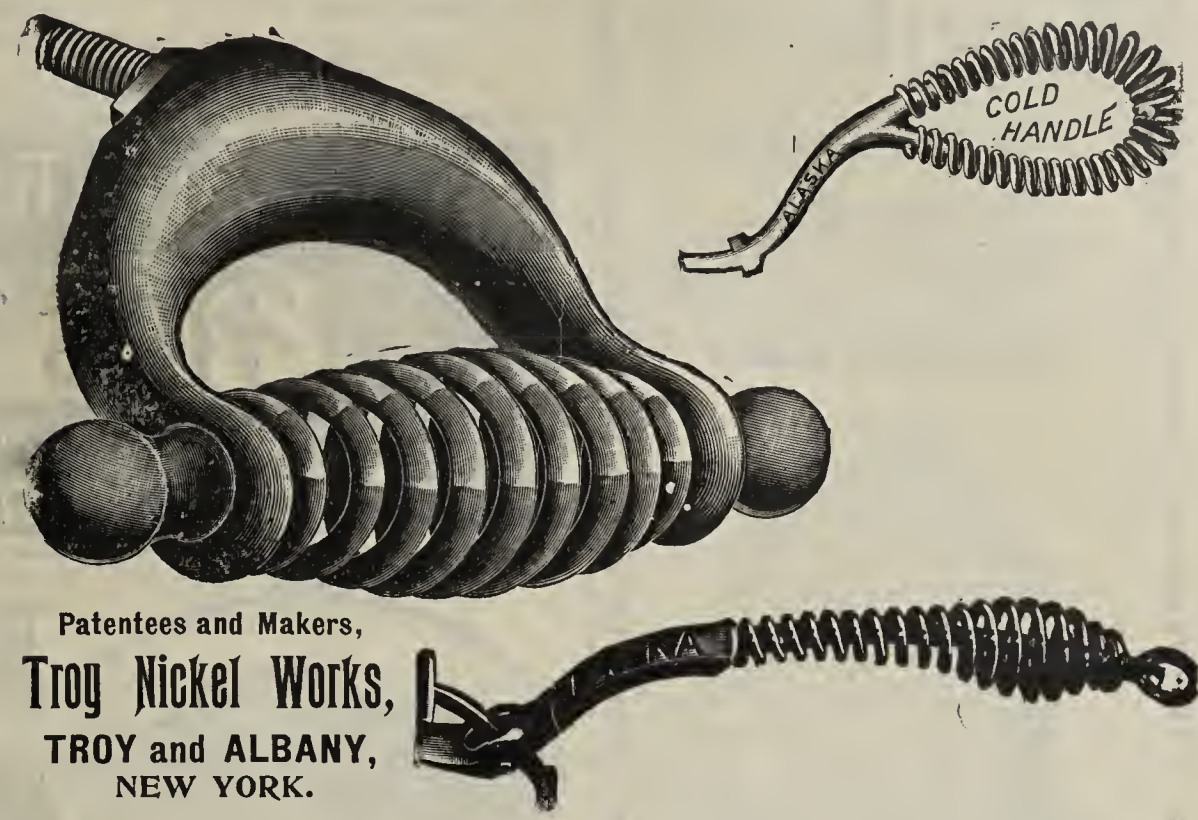
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This is not as old as other Dampers, but it's getting there just the same, and re-orders proclaim the fact that it's liked by the users. Made in all sizes. "Handle Nickel Plated."

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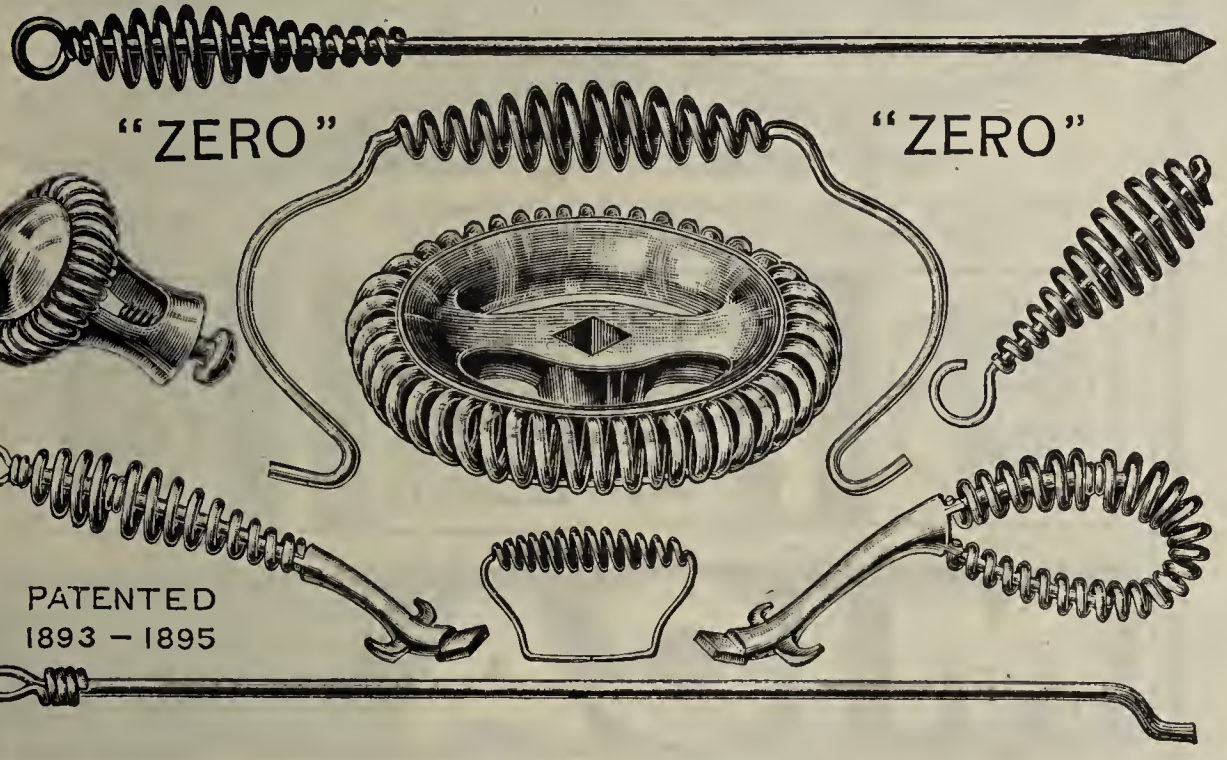
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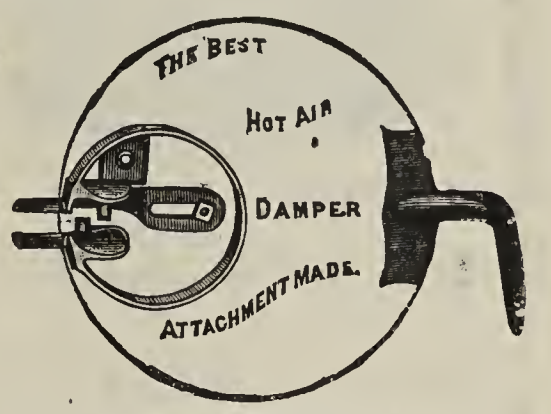


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WAFFLE IRONS.

The Best for Gas or Gasoline Stoves. Easy to Clean. Long Wood Handles.

Buy no other.

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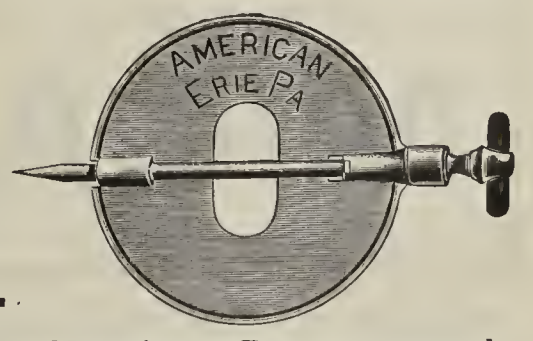
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At this Bargain Package for

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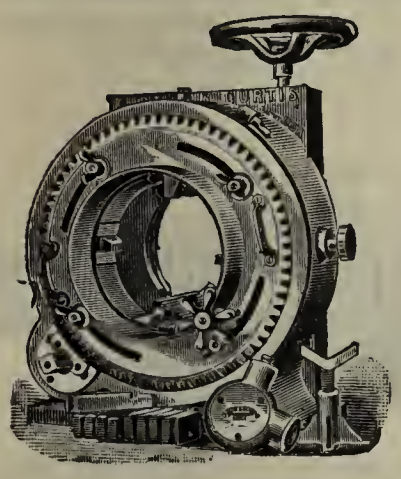


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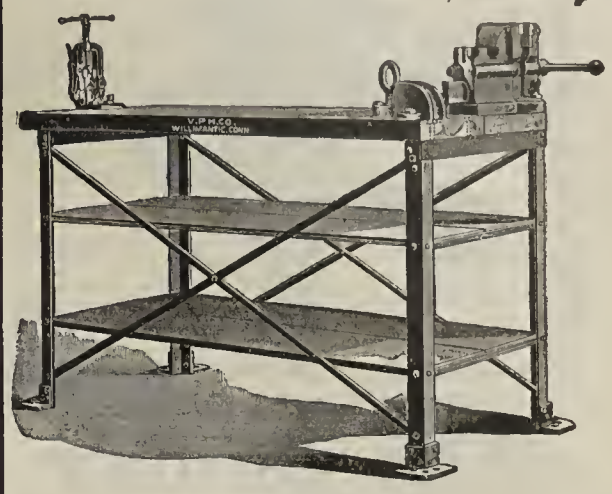
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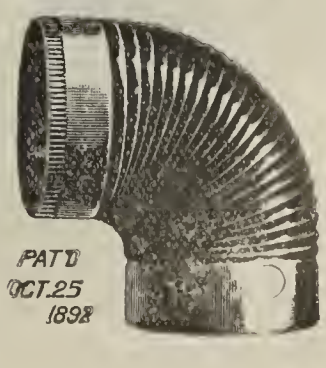
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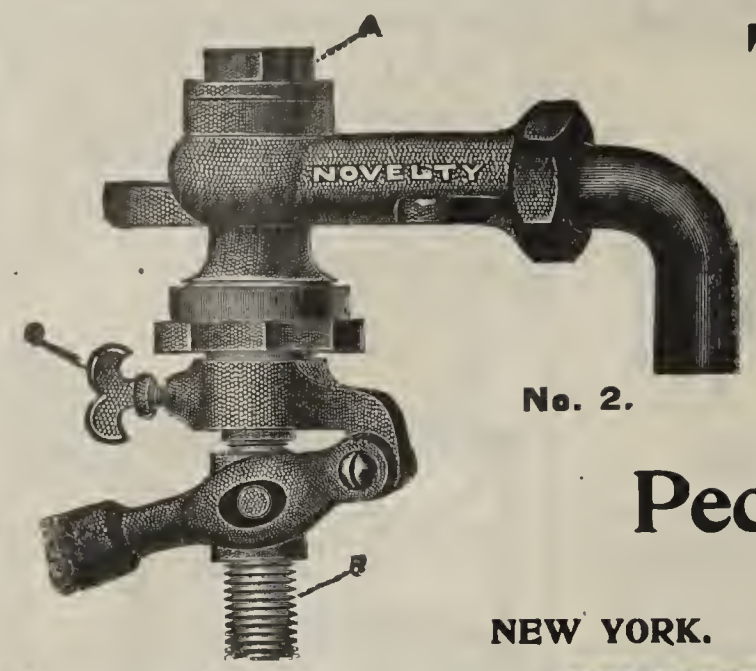
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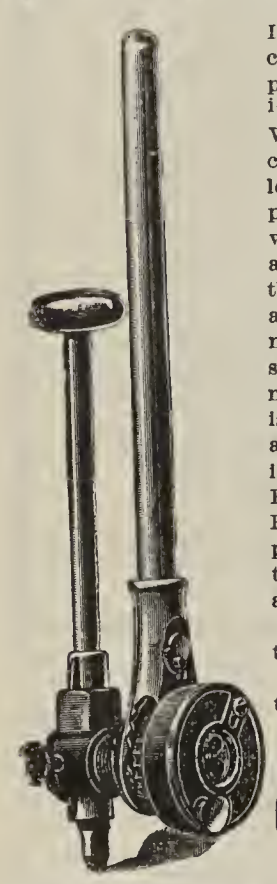
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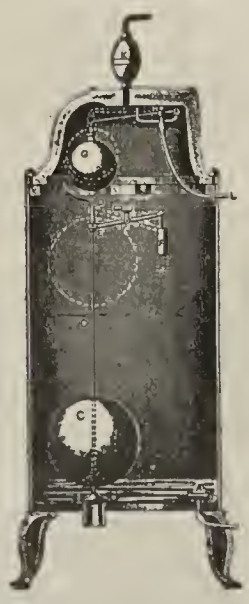
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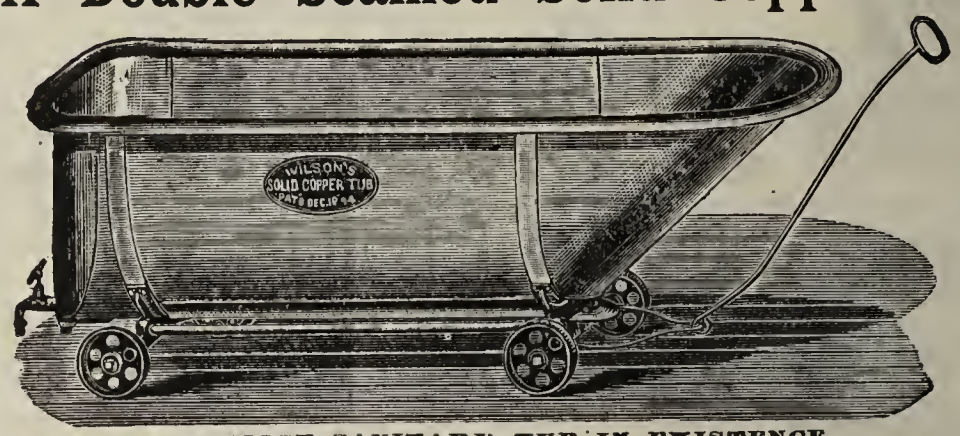
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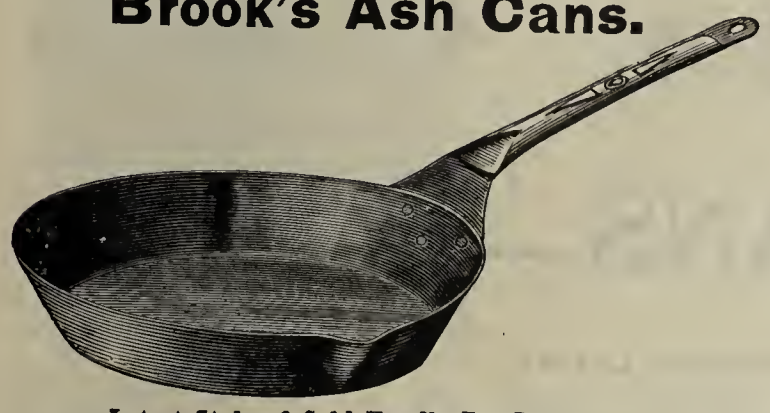
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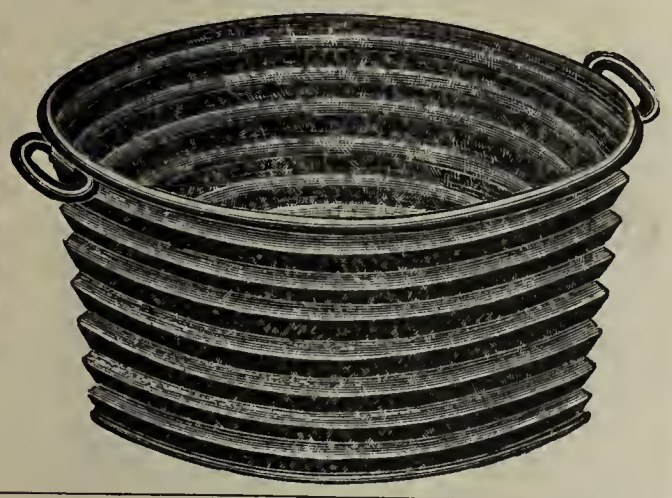
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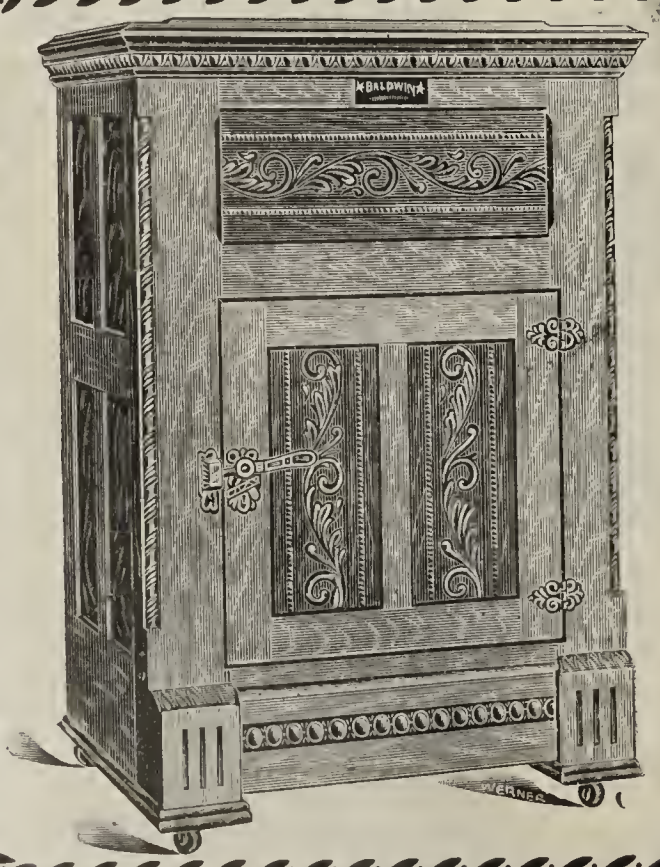
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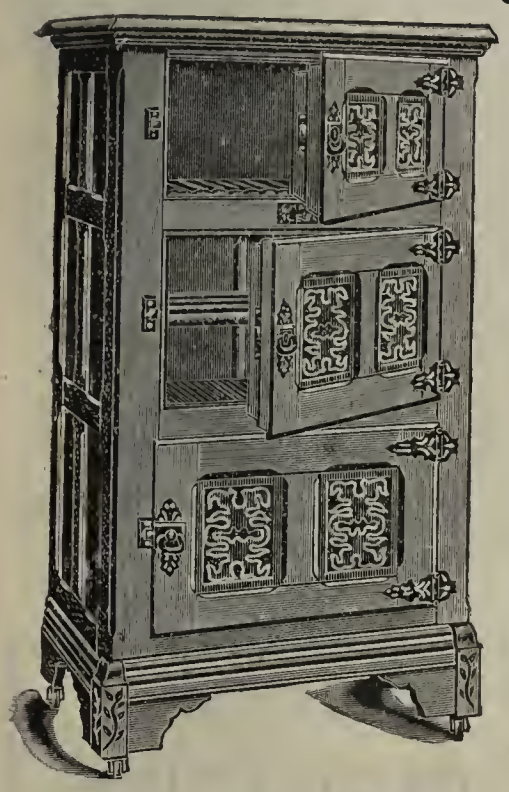
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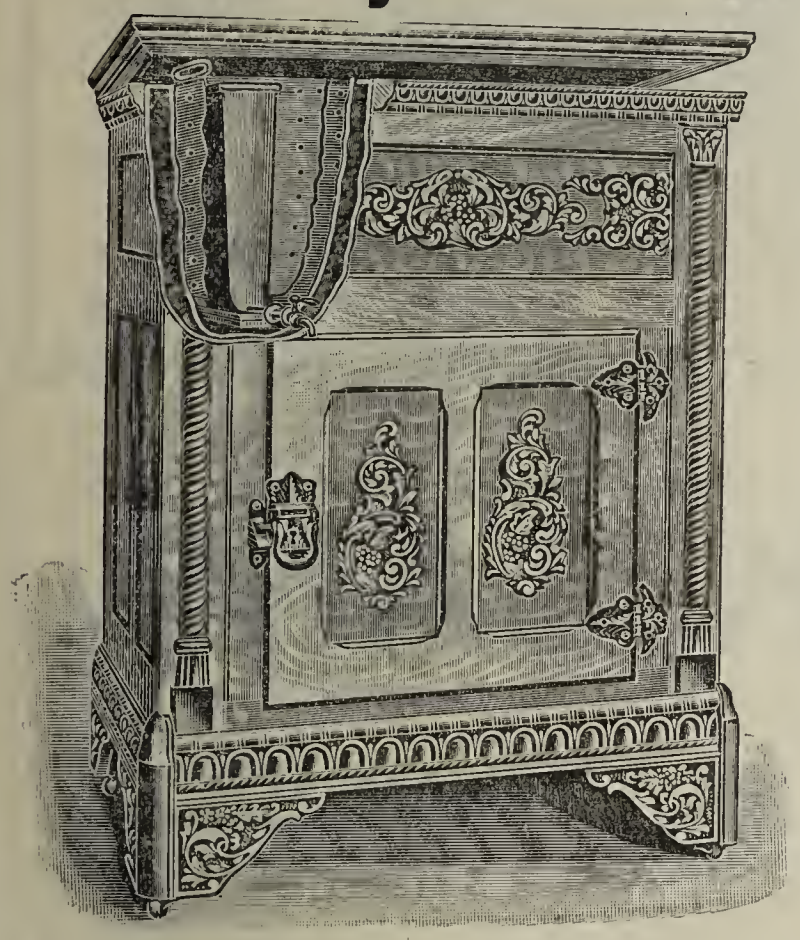
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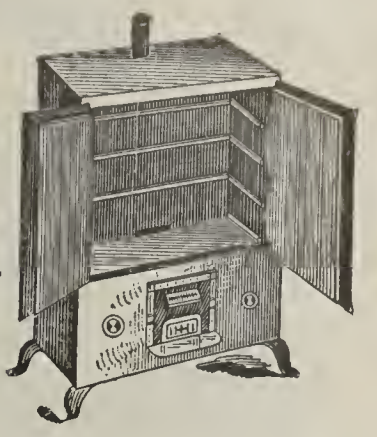
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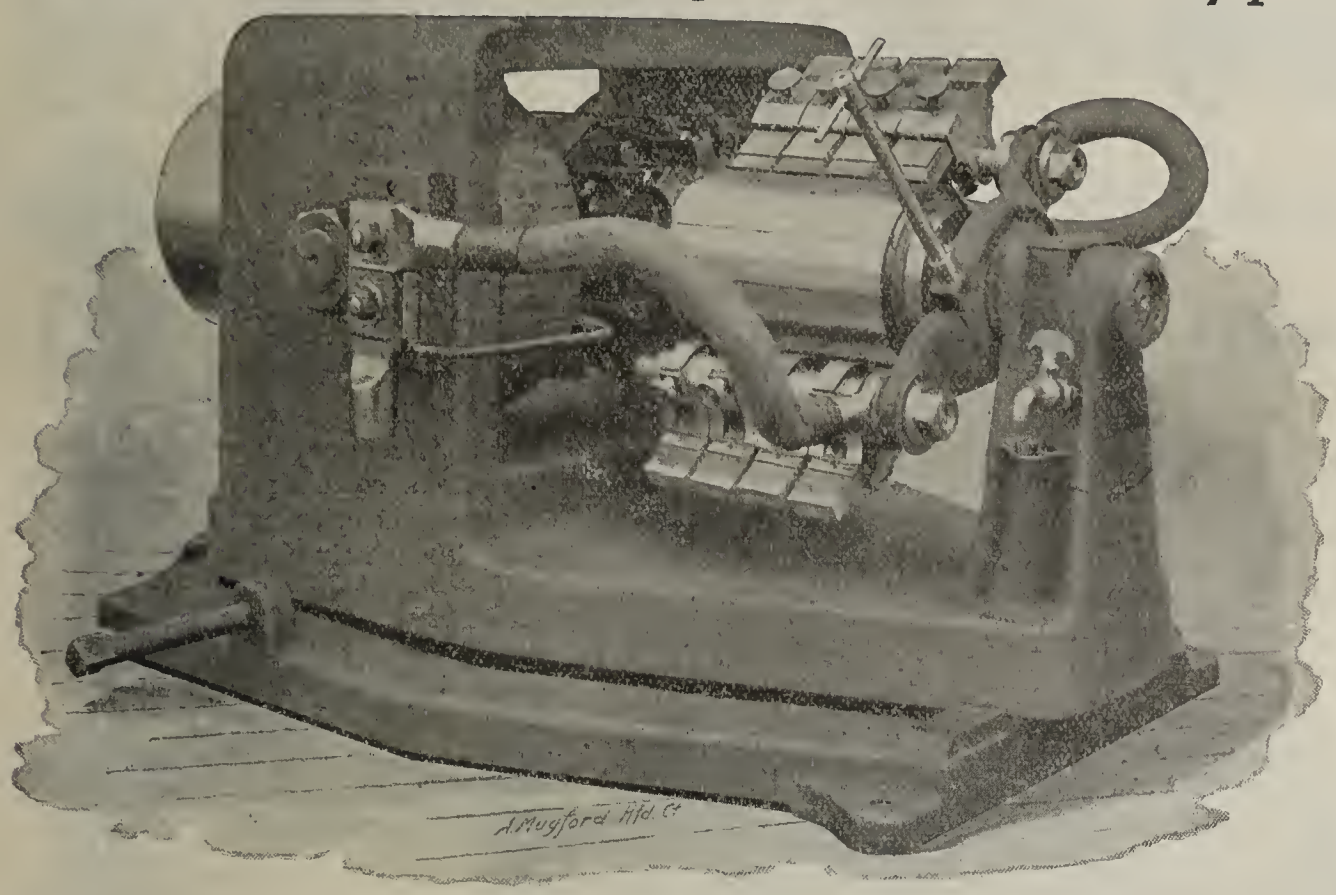
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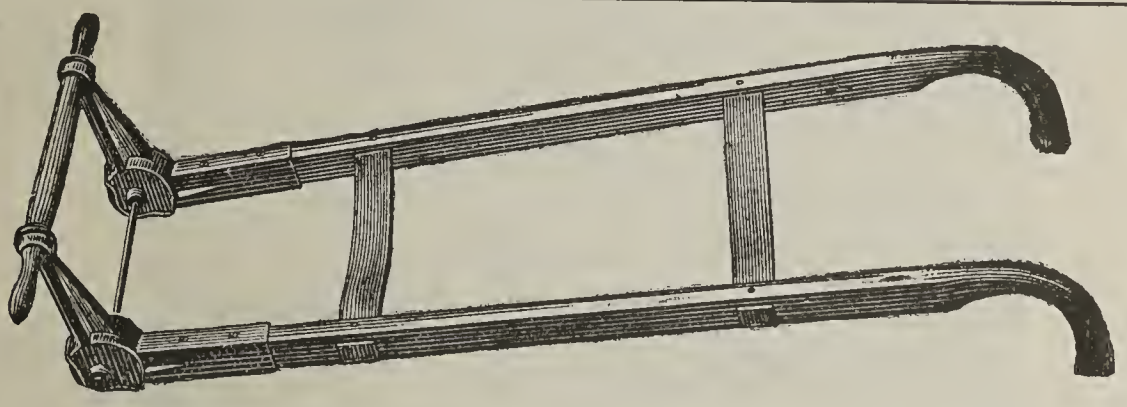
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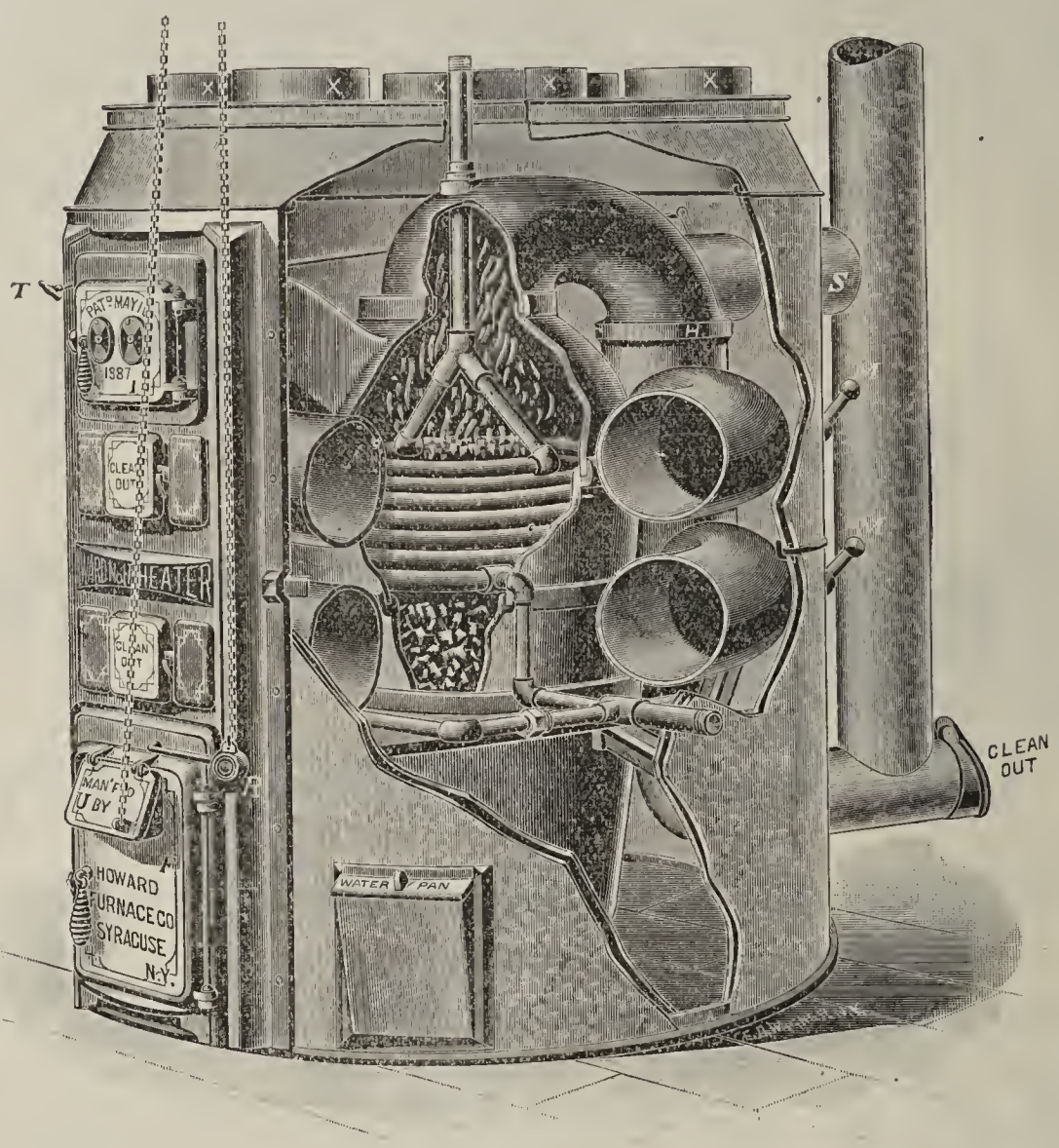
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THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, January 1, 1898.

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Past, Present and Future.

The generous response to our letters of inquiry sent out to the several trades *The Metal Worker* represents is evidence of the interest our readers take in the reviews we have published in our first January issues for a number of years past. The more important trades are dealt with at length in their proper departments, and whoever will take the trouble to read the summaries and the letters that accompany them will gain a trustworthy knowledge of the course of business in these lines during 1897 and learn what views are held concerning the prospects for the new year we are entering upon. The summer and fall of 1896 was a gloomy and unsettled period to many, but with the end of the year the prospect brightened and the belief grew that 1897 would bring happier times in the industrial and commercial world. These hopes, however, did not reach an early fruition, and the months came and went in exasperating dullness. Not until well on toward the middle of the year was there any decided increase in activity, and even then it came from an unforeseen cause—the shortage of the grain crop abroad and the abundant harvest in this country. Prosperity returning to the agricultural classes, the manufacturers ministering to their wants became benefited by the increasing demand for their products and the volume of business grew to gratifying proportions. But the wished for advance in prices did not come; nor is this so much to be wondered at when it is considered that manufacturers had been on short rations so long and were desperately hungry for the smallest slice of trade. This is what the record of the year shows: A dull trade in the beginning, a good trade later and stationary prices with only a moderate profit to carry over into 1898. Of course, this is not the year's history for every individual or for every trade, but from the returns we have received it is a fair presentation of the year in all the industries we represent. The better conditions prevailed most noticeably in the West, and the Atlantic States and New England States have not as yet had their full share of the benefit, while in the South the low price of cotton and the yellow fever conspired to keep business dull and profitless. Turning now from what has gone to what is to come, we pass from fact to guess work, and perhaps we cannot do better than to repeat the candid confession of one of our correspondents, and say that "we are neither prophets nor sons of prophets." It is gratifying, however, to note that most of those who have written us speak hopefully, though not enthusiastically, of the outlook, and the general belief seems to be that the new year will bring a fair trade and not unlikely a moderate advance in market values. We join our readers in hoping that this will prove an understatement rather than an overstatement, and that 1898 will bring increased prosperity, wider margins of profits, and to one and all a Happy New Year.

The Result of Sanitation.

Three years back New York City began a movement for the systematic inspection of the tenement house districts and for a more rigid enforcement of all sanitary laws affecting them. At the same time Col. George E Waring undertook the task as Street Cleaning Commissioner of introducing, for the first time, a thorough system of street cleaning. Two years ago the State Legislature passed a law empowering the Health Department of the city to condemn and demolish all the "rear" tenements and to force the owners of the "rookeries" and unsanitary dwelling houses to carry out the repairs necessary to make them wholesome and fit for habitation. Appropriations were made, too, on a large scale for the laying out of public parks in the crowded districts and for the building of recreation piers on the river front. All these desirable reforms have been carried out or put in train, and the improvement in the health of the city has been remarkable in consequence. Figures recently published by the New York Health Department giving the deaths and mortality rates of the city for the first eleven months of each year since 1891 bear eloquent testimony on this line. They are as follows:

Year.	Deaths.	Death Rate.
1891	39,925	26.24
1892	41,113	26.26
1893	40,959	25.44
1894	38,123	22.99
1895	40,135	23.30
1896	38,803	21.89
1897	35,794	19.62

It will be seen that the deaths this year were actually 5319 less than for the corresponding period of 1892. But these figures do not represent the actual measure of improvement, for there has been a very considerable increase in population in the interval. Taking the average rate of yearly increase in population, the gain of human life this year in New York City, on account of better sanitary methods, clean streets, &c., must be about 13,500. The results accomplished are little less than wonderful, considering the short time in which the sanitary reforms have been in operation.

One very notable event of New Year's Day, 1898, is the coming into existence of the Greater City of New York, with a population equal to that of thirteen of the new States and Territories, whose area is 3000 times greater than that of the city. The annexation of the city of Brooklyn and a large territory on Long Island, Staten Island and above the Harlem River to the original city of New York creates a great metropolis of 3,200,000 population, with an area of 360 square miles, second only to London among the cities of the

world. The assessed value of real estate in the enlarged city is $2,264,142,968, and the value of personal property $397,076,668. Its manufactures employ 635,000 workmen, who are paid about $400,000,000 a year in wages. The growth of the new city from the time, in 1626, when the Dutch purchased Manhattan Island from the Indians for $24, to the present, when land in the greater city is worth on an average $125,000 an acre, or about 50 cents a square foot for the entire 360 square miles, is a remarkable one.

Frequency of Personal Damage Suits.

Personal damage suits against manufacturers, says *The Iron Age* are steadily growing more frequent. In one of our large cities it is stated that almost the entire time of one court is taken up in the trial of causes of this origin. It is not on account of the more dangerous character of the machinery used, nor is it because of a natural increase in the number of accidents to correspond with the growth of manufacturing industries. It is to be attributed partly to the fact that damages have been collected in some instances of personal injury, and others are thus incited to sue, and partly to the efforts of lawyers to secure clients and fees. In almost any instance in which a report of an injury to a workman is printed in the daily papers, the ink is hardly dry on the edition before attorneys appear who advise a suit, with no charge for their services unless successful. The employer is almost invariably called on to defend himself in court, at a waste of much time and perhaps considerable money, whenever a workman is hurt about a factory. An instance of this occurred quite recently. Some gasoline exploded while a gasoline engine was being tested in a shop, and a workman was so scared that he jumped out of a window and injured himself seriously. He sued the owner of the factory for $10,000 damages, but was beaten. The jury evidently believed that he should not have jumped, and that he did it at his own risk. Although the employer was not mulcted in damages, his outlay was probably quite heavy for attorneys' services and other legal expenses. This is the annoying phase of the matter. In attempting to dispense justice, our courts frequently do much injustice.

The Foundrymen's Defense Association.

The committee appointed at the meeting of the foundrymen in New York December 1 to prepare a constitution and by-laws for the proposed Foundrymen's Association that is being organized to facilitate the equitable adjustment of labor questions held a meeting in that city December 15 at the house of the American Society of Mechanical Engineers. A constitution and by-laws was drafted that it is confidently expected will meet with the approval of those who are expected to be interested in this new association. An address was also drawn up to be sent to a number of the leading employers of foundry labor in the country calling a meeting for the purpose of final organization January 26. This date was selected as a most desirable one because the National Association of Manufacturers meets in that city January 25, 26 and 27. A large number of the leading foundrymen of the country are sure to be in attendance, and reduced rates of fare will be granted by all the leading railroad systems of America. Fully 100 are expected at this meeting, which will be held in the club house of the American Society of Mechanical Engineers, 12 West Thirty-first street. Headquarters have been established at the Imperial Hotel, Thirty-second street and Broadway, New York.

The Coliseum, at Chicago, one of the largest public assembly halls in that city, and which covered 7½ acres, was destroyed by fire last week. The fire started from crossed electric wires.

Freight Rate Changes.

The Joint Traffic Association has issued the following recent circulars:

Rates on Pig Iron, Old Car Wheels and Axles, &c., Between Buffalo, N. Y., and the Niagara Frontier and Eastern Points.

Pig iron, in carloads, minimum weight 12 gross tons, to Buffalo, N. Y., and the Niagara frontier, effective January 10, 1898. New York (lighterage free, when permissible under current lighterage rules), $1.90 per gross ton, and New York (regular delivery), Philadelphia and Baltimore, $1.90 per gross.

Pig iron, in carloads, minimum weight 12 gross tons, from Buffalo, N. Y., and the Niagara frontier, effective January 10, 1898: Burlington, Vt., $2.30; Boston, Mass., $2.30; New York, N. Y., $1.90; Philadelphia, Pa., $1.90; Baltimore, Md., $1.90.

Old car wheels and axles, old rails, scrap iron and steel and scrap tin, in carloads, from Buffalo, N. Y., and the Niagara frontier, to Boston, Mass., and points taking same rates, $2.70 per gross ton. Between Buffalo, N. Y., and the Niagara frontier (in both directions), New York (lighterage free, when permissible under current lighterage rules), $2.30, and New York (regular delivery), Philadelphia and Baltimore, $2.30.

Westbound Rates on Pig Iron, Billets, Blooms, &c.

1. The duly authorized rates currently in effect upon pig iron, billets and articles taking billet rates, to wit: Blooms, borings, crop ends, ingots, muck or puddle bars, old car wheels and axles, old rails, scrap iron and scrap steel, scrap tin and slabs, also wire rods, sheet bars and tin plate bars, ingot molds, chain iron and pipe iron or pipe steel, in carloads, from the western termini of the Trunk lines and points taking same rates to points west thereof, on the basis of $2.20 per gross ton on pig iron, and $2.50 per gross ton on billets and articles taking billet rates (including wire rods, sheets bars and tin plate bars, ingot molds, chain iron and pipe iron or pipe steel), from Trunk line western termini to Chicago, be continued in effect after December 31, 1897.

2. Effective January 10, 1898, rates on pig iron, in carloads, minimum weight 12 gross tons, from points east of the western termini of the Trunk lines to Trunk line western termini and points west thereof, be established on the basis of $3.90 per gross ton New York to Chicago.

3. Effective January 10, 1898, rates on billets, blooms, borings, crop ends, ingots, muck or puddle bars, old car wheels and axles, old rails, scrap iron and scrap steel, scrap tin and slabs, in carloads, minimum weight 12 gross tons, from points east of the western termini of the Trunk lines to Trunk line western termini and points west thereof, be established on the basis of $4.50 per gross ton New York to Chicago.

4. Effective January 10, 1898, rates on wire rods, sheet bars and tin plate bars, ingot molds, chain iron and pipe iron or pipe steel, in carloads, minimum weight 12 gross tons, now in effect from specific points east of the western termini of the Trunk lines to specific Trunk line western termini and points west thereof on the basis of rates currently applicable upon billets, be established on the basis of the rates herein recommended on billets, in carloads—*i. e.*, $4.50 per gross ton New York to Chicago.

5. Effective January 10, 1898, if the duly authorized local rates on pig iron, billets and articles taking billet rates, wire rods, sheet bars and tin plate bars, ingot molds, chain iron and pipe iron or pipe steel, in carloads, from points east of the western termini of the Trunk lines to Trunk line western termini, plus the duly authorized rates upon said articles from Trunk line western termini to points west thereof, make lower combinations of rates than the duly authorized through rates on like traffic from Eastern points to Western points, it shall be permissible for the railway companies parties to the Joint Traffic Association to publish tariffs on said articles on the basis of such combinations of local rates from such Eastern points to such Western points.

The same rules have been established for the east bound rates on pig iron, billets, blooms, &c.

On ingot molds the east and west bound rates are established on the basis of $4.50 per ton of 2000 pounds New York and Chicago.

The United States Navy Department have signed a contract with the Maxim-Nordenfelt Company for 50 of the new 6 inch automatic Maxim-Nordenfelt guns for the battle ships. All of these guns will be made at the Washington Navy Yard, under a special arrangement with the patentees. The Maxim-Nordenfelt Company will supply the material, and the labor, which will be rendered by the regular navy yard employees, will be charged to their account. The present contract involves the first application of the automatic principle to guns of so large a caliber as six-pounders.

THE LETTER BOX.

List of Tin Plate Works.

From S. D. M., New York.—Please let me know the number of tin plate works in this country, their name, date of erection, size, output and, if possible, the number of mills in foreign countries, each country taken separately.

Answer.—Our correspondent has asked a rather comprehensive question. Respecting the works in the United States, we would refer him to another column of *The Metal Worker*, where he will find our quarterly report, giving a list of the mills and their sizes. Most if not all of these mills when built were mentioned in *The Metal Worker* at the time, but to gather this information would entail searching through our columns for several years back. Information about the Welsh mills can be obtained from a list published in the *Iron and Steel Trades Journal* of London, or if he wants more particular information we would refer him to "Ryland's Iron Trade Directory," published at Birmingham, England, a new edition of which is, we believe, shortly to be printed.

Barn Roof Sweats.

From the Allen Anti-Rust Mfg. Company, Cleveland, Ohio.—In response to the inquiry in *The Metal Worker* December 18 from "M. B.," Baraboo, Wis., in relation to condensation on the under side of a metal roof over an elephant barn, I beg to advise you that we have had large experience in the matter of all kinds of metal roofs, and the only effective remedy we have ever found for a case of this kind is to build an air chamber immediately under the roof, using matched flooring. In the United States Navy there is a remedy used where the steel ships have given a great deal of trouble by reason of sweating on the inside. Here they paint the inside of the metal with Allen's anti-rust japan, and while this paint is fresh they sprinkle it with cork dust, putting the cork dust on pretty heavy or as much as the paint will hold. This cork dust is like sawdust and in some instances ordinary sawdust is used for the same purpose. But our neighbor up in Wisconsin with the elephant house will probably find the only remedy in placing matched flooring forming an air chamber under the roof. Even then he will find it necessary to ventilate the upper part of his building.

From G. H. S., Wilmington, Del.—In answer to the inquiry of "M. B.," in *The Metal Worker* of December 18, in regard to a method for overcoming troublesome condensation, I would say that I have had the same thing to contend with and have used asbestos paper. In this case it should be fastened to the under side of the rafter with a tin cap the same as is used for tar roofing, nailing 6 inches apart, starting the paper at the bottom and running it up toward the deck. This paper is fire proof and will prevent the moist air from coming in contact with the cool surfaces. He will find that the ventilators cannot be depended upon entirely to prevent the condensation, as they would let all the heat escape. I have used this method where the roof had only 3 inches fall to the foot and the whole structure was made of iron, rafters and all. Asbestos paper is superior to the ground cork which the United States Government uses for a similar purpose. I have tried both, applying the cork to the surface, which had been previously coated with a good white lead paint. The fine cork is thrown against the paint while it is wet, and as the paint dries the cork adheres. This method is, I think, not as good as the asbestos paper with an air space would be in the present case.

A Ventilating System in Connection with a Furnace.

From Anxious Inquirer.—I notice in *The Metal Worker* of December 18 the article entitled "A Ventilating System in Connection with a Furnace," and would like some information as to the following seeming inconsistencies: The smoke pipe is 12 inches in diameter and has an area of about 113 square inches. The ventilating pipes are combined and attached to the smoke pipe by one 14-inch round pipe, which has an area of 154 inches, or about one-third more area than that of the smoke pipe. It is evident that all the air passing through the ventilating pipes must escape through the smoke pipe. The invention is patented and, therefore, all rights being secured to the inventor of this most interesting system, I would esteem it a special favor if he would state in what way he secures an exhaust in the ventilating pipe and what the effect is upon the draft of the furnace when he uses for ventilation the whole and one-third more than the entire smoke pipe area.

Note.—We present the letter of this correspondent and call his attention to the fact that in the opening part of the article it is stated that the system has been in operation during one winter and that it is noticed that the long pipes leading to distant rooms have a good flow of air. It is possible that the difference in the areas of the two pipes may be explained by assuming that the air in the ventilating system being cool travels very sluggishly and only a comparatively small number of cubic feet of air pass through the large pipe in a given time, while on account of the heat in the smoke pipe a much greater velocity is attained and by this means the apparent inconsistency is practically nullified. We shall be glad to have the inventor make any further explanation that he may consider necessary.

From C. P. E. Chicago.—I like the heating system shown in *The Metal Worker* of December 18 very much, having examined it with great care and interest. Some time later, however, I would like to hear from some one who has talked with the occupant of the house and learned his experience in running the furnace. One of the points that I would like to have commented on is, Does the furnace heat well when the ventilating system exhausts into the smoke pipe? I have great doubts as to this, as I once had a somewhat similar system in my own house.

Note.—To this correspondent we can only say that the system has passed through one season's practical test with satisfaction to all concerned.

The Advantages of an Intercepting Trap.

From X.—I would like to know what benefit the running trap furnishes when placed on a horizontal line of soil pipe, as required in many specifications, and if it is necessary in a first-class job.

Note.—This is a question on which many sanitary authorities disagree. Some urge that if a fresh air inlet is provided there is no occasion for the intercepting trap, provided the fixtures in the building are properly trapped and proper measures taken to prevent their being siphoned. This view, however, is different from that which is entertained by the health authorities and the plumbing inspectors in many large cities. Either the front wall or running trap on the horizontal line or intercepting trap, as it is variously called, is required in a majority of cases, although there are exceptions where some cities do not require it.

STOVE TRADE NOTES.

A Review of the Stove Trade.

BY GEORGE W. COPE.

Those who expected to see an enormous stove trade in 1897 were disappointed. Quite an improvement was realized over 1896, and a few manufacturers report a large volume of business, but it must be admitted that results generally were not up to expectations. A conservative estimate based upon wide observation by men of good judgment and long experience puts the gain of the whole country over 1896 at 10 per cent. Probably the year opened with hopes set too high. The country had been favored with excellent crops, political agitation had been settled, national finances were again in good shape, foreign countries were buying heavily of our surplus products, and as far as the future disclosed itself to mortal vision not a disturbing element was to be seen. Why should a country not be prosperous under such conditions? It was assumed that the restoration of confidence in business and financial circles would act upon the country like the removal of a weight from a spring. Suspended operations were to be resumed, new enterprises were to be started up, the idle millions were to be set to work and the bustle of good times was to pervade every section of the country. But the reaction came about very slowly. Instead of a sudden jump to prosperity, the work of rebuilding our depressed activities has proved a matter of gradual growth, which may be spread over a couple of years. Perhaps it is better that this is the case. Too rapid a reaction to good times would have caused all values to climb so high that business would have been disorganized. It is certainly better for all concerned that the march to improvement should be made by easy stages and gradual gains than by a gallop which wrecks all calculations. Looking back over the year, the following details of the course of trade present themselves:

FIRST QUARTER.

Despite the conservatism of manufacturers and merchants in the closing months of 1896, large stocks of stoves were carried over for the following season. Under normal conditions these stocks might not have been deemed excessive, but they were too heavy for such a period of general business depression. January was intensely dull, making a worse record than the corresponding month in 1896, which had been thought bad enough. Very few manufacturers had the temerity to operate their foundries at this time. Some of them started up late in the month, or in February, but more in the hope that their resumption of work might have a moral effect in improving general trade than because of an actual demand for stoves. With the increasing disposition to look to national legislation for relief, the coming of the Fourth of March was anxiously awaited, in the hope that the change of administration might work some miracle, but no improvement was seen even after that important political event. In such specialties as steel and gas ranges, however, business was not quite so poor as in cast coal and wood stoves. In fact, in some important trade centers the demand for steel ranges was reported to have shown a marked gain on preceding years, while the gas range manufacturers were particularly pleased with the results in that branch. Gas companies in a number of cities made more liberal terms for those consuming gas for fuel, thereby stimulating the demand for gas stoves. Manufacturers of gasoline stoves made strenuous efforts to increase their trade, both by lowering the prices of stoves and by almost guaranteeing that the price of gasoline would be lower than in the summer of 1896, but their sales ran little if any above those of the corresponding period of the previous year. During this quarter the coal stove manufacturers and wholesale merchants held several meetings, endeavoring to devise some plan for the improvement of their business, but all such efforts came to naught. Meanwhile prices on iron and steel had been falling, owing to the slack demand during the winter months, and this was regarded as indicating little hope of an early recovery in general trade. Seldom had the iron business of this country been in such a deplorable plight as during these months. But the forces destined to bring about recuperation were actively at work. Short crops abroad were compelling foreign buyers to draw heavily on our stores of grain, and as our exports increased prices advanced, bringing more prosperous times to farmers' homes.

SECOND QUARTER.

An improving tendency was first seen in the Western stove trade, as might have been expected. The better prices realized for wheat were directly to the advantage of the agriculturists of that section, and in April evidences of their improved financial condition began to be seen. In May a notable increase took place in the Western demand for cast ranges and cooking stoves. At this time a better feeling also made itself manifest in other branches of trade. Factories which had long been idle resumed operations, those running employed more hands, and prospects therefore grew brighter for the stove trade in towns and cities. June saw the Western manufacturers fairly busy, booking good orders for fall delivery. The spirit of caution, however, dominated the buyers, who placed their orders for shipment at dates somewhat later than usual. The demand for immediate delivery at this time was not large. Much interest was taken in the crop outlook, as on that, it was evident, would depend the course of the trade for the remainder of the year.

THIRD QUARTER.

July and August were months of good trade, especially in the West and South. Heavy gains were made on the corresponding period of 1896. In fact, it was estimated by unusually well informed members of the trade that up to September 1 a much larger business had been done by Western houses than during the whole of the previous year. Manufacturers were greatly encouraged, and looked forward to a still better business during the fall months. But September proved to be an excessively hot and dry month, breaking the records for heat for that month. Drought conditions made themselves manifest over a large part of the country. Grave apprehensions

prevailed that the fall crops might be seriously injured, which would severely blight the improving business prospects in a number of States. Cool weather and rain were earnestly prayed for, but they failed to come.

LAST QUARTER.

The month of October, emulating September, also broke the record for autumnal warm weather. The drought continued, but was much more severe in Wisconsin, Kentucky, Tennessee and Southern Illinois and Indiana than in other States suffering from scanty precipitation. Frost, however, was exceptionally tardy in making its appearance, so that all late crops matured, and some benefit was thus realized from the mildness of the weather. Yellow fever broke out about this time in Mississippi, spreading into Louisiana, and causing rigid quarantine regulations to be established in Arkansas and Texas, which interfered decidedly with the Southwestern trade. Colder weather in November brought an improved demand, which developed into a semblance of briskness as the month grew older. Shipments were hurried, showing that stocks were very small in dealers' hands. The demand continued good well into December, diminishing and increasing with alternations of warm and cold weather.

Special Features of the Year's Trade.

Among the especially noteworthy features of the year's trade may be enumerated the following:

1. The first four months of the year are entitled to the bad distinction of having been the worst period the stove trade has ever known.

2. Our manufacturers, as usual, exhibited remarkable enterprise in bringing out new patterns and in a few instances entirely new lines of stoves.

3. The improvement in trade was primarily due to short crops abroad and heavy crops in this country, which restored purchasing power to farmers. Without this great leverage the most enterprising manufacturers might have been able to hold their own at the expense of their less able competitors, but there would have been no general improvement.

4. Few stove manufacturers are now dependent on cast stoves and ranges. They have added to their output steel ranges, or warm air furnaces, steam heating boilers, hot water heaters, gas stoves, gasoline stoves, oil stoves or even the scorned tamale. The tendency to cut loose from old methods was never more marked than it has been in the past year.

5. It would be interesting to know how the aggregate value of stoves sold in 1897 would compare with that of previous years. An important percentage of stove manufacturers has been forced out of the business in the past three or four years, and at the same time cheaper and cheaper goods have been substituted for the ancient standards in the trade, so that despite the improved demand of 1897 it is believed that the aggregate value of the stoves sold would fall below that of even 1893 or 1894.

6. The year was almost wholly free from labor troubles in the stove foundries, the only occurrences of this character having taken place in some of the Southern stove works outside of the Defense Association.

7. It was one of the very few years in which no complaint was heard of the cancellation of orders.

Prospects for the New Year.

It is easy to talk hopefully when cheerfulness is the predominant feeling in all trade circles. Every business man is looking forward to 1898 as a year which promises fat things. On all sides preparations are being made for expansion. Two of our very great interests, agriculture and railroads, are in an exceedingly prosperous condition. Farmers are paying off mortgages, redeeming lands sold for defaulted interest and taxes and taking possession of abandoned properties, while railroad companies are reporting larger earnings than ever before in their history. Innumerable related interests are thriving on the prosperity of these two, and it is difficult to see how the coming year can bring bad trade in any branch. The fact that the masses of the people now have fuller employment should cause a great increase the coming spring in the demand for ranges and other cooking goods. But perhaps the most desirable feature of improving times is the expected revival of the demand for the better classes of stoves and ranges. A heavy demand for high priced goods would bring back the halcyon days of the leaders in the trade.

Trade Meetings.

The most important stove trade meeting of the year was the Twenty-sixth Annual Convention of the National Association of Stove Manufacturers, which was held in Detroit, Mich., on May 12 and 13. The attendance was large, and much interest was taken in the proceedings. It was decided to establish a co-operative stove repair sales house in Chicago, and a committee was appointed to carry the decision into effect. This, however, has not been done up to the present time, although the practicability of the scheme is generally conceded. The election of officers resulted as follows:

President, Charles S. Prizer of Orr, Painter & Co., Reading, Pa.

First Vice President, Francis Kernan of Syracuse Stove Works, Syracuse, N. Y.

Second Vice-President, N. H. Burt of Great Western Stove Company, Leavenworth, Kan.

Secretary, T. J. Hogan, Chicago.

Treasurer, W. F. Stevenson of Thomas, Roberts, Stevenson Company, Philadelphia, Pa.

Central Executive Committee: The officers of the association, together with Franklin L. Sheppard, Philadelphia; R. G. Rennolds, Richmond, Va.; Jasper Van Wormer, Albany; W. E. Walker, Taunton, Mass., and Fred. W. Gardner, Chicago.

The association decided to hold its convention in 1898 in Philadelphia. A special feature of the Detroit convention was the round of entertainments provided by the Detroit manufacturers. They made the occasion a memorable one in the annals of the association.

THE DEFENSE ASSOCIATION.

The Stove Founders' National Defense Association met in Detroit during the same week, but held only a brief session. No labor troubles either had occurred or were pending, so that the proceedings were of a routine character, consisting merely of the presentation of the officers' reports and the annual election, which resulted as follows:

President, Chauncey H. Castle, Quincy, Ill.

Vice-President, Henry Cribben, Chicago.

Treasurer, Abram C. Mott, Philadelphia.

Secretary, Thomas J. Hogan, Chicago.

Executive Committee: The officers just named, *ex-officio*, and Grange Sard, Albany, N. Y.; C. S. Prizer, Reading, Pa.; Jeremiah Dwyer, Detroit, Mich.; W. W. Baldwin, Cleveland, Ohio; W. T. Bradberry, Allegheny, Pa.

STEEL RANGE MAKERS.

An unsuccessful attempt was made at Detroit to form a steel range association. The manufacturers of steel ranges had been invited to be present and co operate with those stove manufacturers who also make steel ranges in effecting an organization, but the prominent exclusive steel range makers were not represented. The others therefore concluded to defer the project for the time being, although all of them were convinced that the condition of the business would be greatly benefited by an association if it could be made comprehensive. The year passed without any further steps being taken in this direction.

FURNACE MANUFACTURERS.

The failure of the effort in 1896 to form a national association of furnace manufacturers did not wholly discour-

age attempts at organization in this branch of trade. A practical association was organized by Eastern manufacturers named the Furnace Manufacturers' Association, which held frequent meetings in New York City during 1897. Nearly every furnace manufacturer in the East has enrolled his name on the list of members. The meetings were not only interesting but were productive of valuable results to the members. Among other important matters accomplished a standard uniform contract blank was adopted for the use of furnace dealers in contracting with customers, which has met with universal favor.

The Western furnace manufacturers held a meeting April 7 in Chicago and formed the Western Furnace Manufacturers' Association, with the following officers :

President, C. A. Sercomb.

Vice-President, H. N. Reynolds.

Secretary and Treasurer, A. W. Glessner.

Executive Committee, H. H. Kennedy, A. P. Richardson and E. P. Mott

Several meetings were held subsequently and important action was taken relative to trade abuses.

NEW ENGLAND STOVE MAKERS.

The New England Stove Manufacturers' Association held their fifth annual meeting in Boston on May 27 and elected the following list of officers :

President, R. E. Warner of White, Warner & Co.

Vice-President, P. W. Elliott of the Highland Foundry Company.

Secretary and Treasurer, H. A. Tinkham of White, Warner & Co.

Executive Committee, W. A. Spicer of the Spicer Stove Company, W. E. Walker of the Weir Stove Company and G. L. Walker of the Century Stove Company.

P. W. Elliott was presented by the members of the association with a silver and gold loving cup in recognition of his services as secretary and treasurer since the organization of the association in 1892.

VAPOR STOVE MAKERS.

The Vapor Stove Manufacturers' Association held their annual meeting at Cleveland, Ohio, August 3, adjourning to Little Mountain, a local summer resort, where they completed their business. The following officers were elected :

President, Isaac Kinsey of the Dayton Mfg. Company.

Vice-President, D. E. Dangler of the Dangler Stove & Mfg. Company.

Commissioner, F. L. Alcott of the Standard Lighting Company.

The United Vapor Stove Manufacturers' Association, makers of evaporating stoves, held their meeting on the next day and elected the following officers :

President, Paul Schneider of the Schneider & Trenkamp Company.

Vice President, O. P. Moon of the National Vapor Stove & Mfg. Company.

Commissioner, F. L. Alcott.

The members of these associations met again at Cleveland September 23 and organized the Union Vapor Stove Company, into which they merged all their patents on gasoline stoves, electing Paul Schneider president, E. C. Baxter vice-president and F. L. Alcott secretary and treasurer.

EQUITY PROTECTIVE ASSOCIATION.

The annual meeting of the Equity Protective Stove Association of the United States was held at Troy, N. Y., November 4. This is an organization which has proved of much value to the members in the settlement of patent claims and litigation. Charles A. McLeod was elected president and E. T. Anthony secretary and treasurer.

Quite a number of local meetings of stove manufacturers were held at various points during the year, some of them being of considerable importance. Their proceedings were private, but so far as could be learned the results accomplished had but little effect on the trade or on prices.

Improvements in Plant.

The march of enterprise among stove manufacturers steadily continues, whether times are dull or brisk. Preparations were made during the year in numerous instances to handle a larger business. It is gratifying to note these evidences of thrift. While there may have been many improvements made of which we have no record, those which have come under our observation are as follows, arranged in chronological order :

John E. Gaitley of the Troy Nickel Works, Troy, N. Y., purchased the plant formerly operated by the Perry Stove Company, at Albany, for the purpose of securing increased facilities for the manufacture of Alaska stove trimmings.

William Highton & Sons, Nashua, N. H., manufacturers of hot air registers, ventilators, &c., added considerably to the capacity of their works.

Weir Stove Company, Taunton, Mass., built another warehouse, 50 x 75 feet, two stories high.

Southard, Robertson & Co., Peck slip and Water street, New York, added another story to their warehouse and put in an electric elevator.

The Charter Oak Stove & Range Company, St. Louis, added a new building, 84 x 112 feet, for offices and sample room.

The Crow Stove Polish Company, Milwaukee, Wis, erected a brick factory, 26 x 80 feet, two stories high.

Floyd, Wells & Co., Royersford, Pa., added a five-story brick building, 67 x 98 feet, to be used for offices, shipping department, nickeling and polishing departments, tin shop and additional mounting floor and storage.

A. Weiskittel & Son., Baltimore, Md., purchased 25 acres of land near their factory for the erection of enameling works, iron foundry, &c.

Geo. M. Clark & Co., Chicago, removed their factory to Harvey, Ill., securing very much larger quarters and improved shipping facilities, greatly increasing their capacity for the transaction of business.

The S. M. Howes Company, Boston, made extensive improvements in their arrangements for handling stove repairs and stove dealers' supplies.

Robert Robinson & Sons and the Robinson Furnace Company removed to 107 and 109 Lake street, Chicago, securing an enlarged space greatly needed for the accommodation of their growing business.

The Front Rank Steel Furnace Company, St. Louis, Mo., removed to a new factory on the northwest corner of Twenty-third street and Lucas avenue, affording much more space for their rapidly increasing trade. The new factory is 100 x 125 feet, six stories high, with a basement.

The Great Western Stove Works, Leavenworth, Kan., added a nickel plating plant to their works. Their nickeling had previously been done outside.

The Richmond Stove Company, Norwich, Conn., purchased adjoining ground and buildings sufficient to give them a frontage of 1000 feet on the Thames River and thus enable them to greatly increase their facilities.

The Buckwalter Stove Company, Royersford, Pa., erected a two-story building, solely for office purposes.

The Walker & Pratt Mfg. Company built a new foundry at Mount Auburn, Mass., which they will shortly move into, the structure covering about 3 acres of ground.

The Indianapolis Stove Company, Indianapolis, Ind., purchased the Indianapolis Cabinet Company's plant on Malott avenue, covering 5 acres, and remodeled it for the manufacture of stoves, thus greatly increasing their facilities. The old plant was kept in constant operation until the new one was ready for use.

The Ringen Stove Company, St. Louis, enlarged their steel range factory, making the output of Quick Meal steel ranges 35 daily.

The Olive Stove Works Company, Rochester, Pa.,

erected a brick addition to their plant, 48 feet long and two stories high, to accommodate their growing business.

S. B. Sexton & Son, Baltimore, Md., opened a new retail store at 7 Gay street, the building containing five floors and a basement and communicating with three upper floors of an adjoining building, also occupied by the firm. The upper floors are used for warehouse purposes, supplementing the firm's other warehouses.

The Estate of P. D. Beckwith, Dowagiac, Mich., installed a new steam plant in the Round Oak Stove Works, comprising an Allis engine and Babcock & Wilcox boilers. The engine is a heavy duty cross compound condensing engine of 500 horse-power and affords a large addition to the power of the former plant, rendered necessary by the increasing business.

The Detroit Furnace & Heater Company, Detroit, Mich., started the machinery in their new plant December 1. The new plant is about three times as large as the old one, which was burned September 25.

The California Stove & Iron Works, Oakland, Cal., have found it necessary to enlarge their factory to keep pace with the growth of their business. They have a flourishing trade with the Hawaiian Islands.

New Enterprises.

Seldom have so many projects been launched in connection with the stove trade as last year.

The United States Vapor Stove Company, Detroit, Mich., filed articles of association, with a capital stock of $10,000, to manufacture and sell vapor burners, stoves and stove supplies.

The Pilgrim Iron Foundry Company, Plymouth, Mass., have made a departure from the usual practices of the trade. They make one line of ranges only. By this method they are able to produce a range for less money than could otherwise be done.

The Gurney Stove & Range Company were incorporated at Rome, N. Y., with a capital stock of $20,000, to manufacture stoves, ranges, heaters and other metal specialties, including the Gurney oil stove.

The Terre Haute Stove & Furnace Company, Terre Haute, Ind., were incorporated to conduct a general stove business.

The Ideal Foundry Company, capital stock $10,000, were incorporated at Piqua, Ohio, to manufacture stoves and conduct a general foundry business.

The Thomas J. Dowling Company, capital stock $20,000, were incorporated at Albany, N. Y., to operate the plant formerly owned by the Albany Stove Company.

The South Pittsburgh Stove & Foundry Company, South Pittsburgh, Tenn., took out a charter of incorporation.

The Summit Foundry Company were incorporated at Geneva, N. Y., to manufacture stoves. The leading stockholders were formerly with the Phillips & Clark Stove Company.

The Perry Stove Repair & Mfg. Company, Albany, N. Y., were incorporated to manufacture repairs from the original patterns for stoves made by Perry & Co. and the Perry Stove Company.

The Southern Ohio Stove Company were incorporated at Waverly, Ohio.

The Hillsdale Furnace & Foundry Company, capital stock $50,000, were incorporated at Hillsdale, Mich., to manufacture warm air and combination furnaces.

The Walterstroff-Haskell Range & Furnace Company, capital stock $10,000, were incorporated at Minneapolis, Minn.

The Shields Foundry Company, Mansfield, Mass., were incorporated to manufacture stoves and ranges

The National Stove Company, capital stock $10,000, were incorporated at San Francisco, Cal.

The Worthington National Grate Company, capital stock $50,000, were incorporated at Baltimore, Md., to manufacture furnace and other grates.

The Cedar Rapids Stove Company, Cedar Rapids, Iowa, were incorporated to manufacture a patent air tight Todd stove and other heating apparatus.

The Palace Stove Company, Richmond, Va., were incorporated to manufacture a line of triple heating air tight stoves embodying novel features.

The Ideal Stove & Foundry Company, Daleville, Ind., poured the first heat in their new foundry September 1. The town is located in the gas belt, and the company secured not only free fuel, but a free site and a brick building 70 x 160 feet, two stories high. They purchased from the Girard Stove & Foundry Company, Youngstown, Ohio, the patterns of the Adelbert line of stoves and ranges. Notwithstanding the lateness of the season the company did a good business.

The Smokeless Fuel Saving Stove Company, capital stock $100,000, were incorporated in New York City.

The Albany Foundry Company, capital stock $50,000, will be organized to manufacture stoves and castings in the old Perry Stove Works, at Albany, N. Y.

The Southern Stove, Hollow Ware & Foundry Company, Chattanooga, Tenn., began manufacturing operations about December 1. This is a notable enterprise, the company being composed wholly of negroes, all of whom are practical molders. C. H. Fearn is president, Will Martin general manager and D. B. Gordon secretary. They make stoves and hollow ware and at present sell their goods to Chattanooga merchants. They have made a successful start in business and feel greatly encouraged. They are pouring three heats per week and melt about a ton of iron at each heat.

Changes and Reorganizations.

Quite a number of changes were brought to our attention as the year passed, but the failures were few and comparatively unimportant.

The old plant of the Mason & Davis Company, at Grand Crossing, Chicago, was taken over by a new corporation styled the M. & D. Range Company, having a capital stock of $75,000.

The Metric Metal Company, Erie, Pa., sold the patents, patterns, stock, &c., of the Classic gas ranges and heaters to the Griswold Mfg. Company of the same city, having New York warerooms at 294 Pearl street.

The Cook & Van Evera Company, capital stock $25,000, succeeded D. S. Cook at 173 and 175 Lake street, Chicago. The business was established in 1868 by D. S. Cook, and he still retains his connection with it. The company market their stoves and ranges under the Jersey trademark.

The Peekskill Stove Works purchased the patterns and business of James G. Lyon, 248 Water street, New York.

J. W. Paxson & Co., manufacturers of foundry facings and supplies, Pier 45, North Delaware avenue, Philadelphia, Pa., became incorporated as the J. W. Paxson Company, with a capital stock of $450,000.

White, Warner & Co., Taunton, Mass., became incorporated as the White, Warner Company, continuing the manufacture of Household stoves, ranges and furnaces.

The Excelsior Stove & Repair Mfg. Company, capital stock of $21,000, succeeded to the manufacture of the Imperial sheet iron wood heating stove and the Up and Down draft radiator, formerly made by A. Ohnemus & Brother, Quincy, Ill.

The Colonial Stove Company succeeded to the firm of Wm. L. Brownback & Co., 70 and 72 North Second street, Philadelphia, Mr. Brownback retiring and Horatio L. Yacum continuing as the liquidating partner under the name above designated.

The patterns, flasks and other personal property of the Superior Stove Company, Superior, Wis., were sold under

foreclosure proceedings to Isaac Everitt of Pittston, Pa., who also controls the real estate.

The Sheffield Stove Works, Sheffield, Ala., changed their name to Sheffield Stove Foundry.

Bridgeford & Co. were incorporated at Louisville, Ky., with $75,000 capital stock and privilege of increasing to $150,000.

Fires.

The Northwestern Stove Repair Company, 225 to 235 West Twelfth street, Chicago, suffered a heavy loss in the destruction of a warehouse, January 24, but saved all their patterns. The damaged portions of their plant have since been rebuilt in the most substantial manner.

The Eagle Stove Company, Fall River, Mass., were put to some incovenience by a fire in their pattern shop February 11.

The A. J. Lindemann & Hoverson Company, Milwaukee, Wis., were visited by fire May 25, but suffered greater damage from the water used in extinguishing it.

The Hudson Stove Works, Hudson, N. Y., narrowly escaped a serious fire August 4, only a few days' interruption to work being caused.

The Detroit Furnace & Heater Company, Detroit, Mich., lost their foundry by fire September 25.

The worst fire of the year was that of the Bonnet-Nance Stove Company, Quincy, Ill , the greater portion of whose works was destroyed October 27, entailing a loss approximating $100,000. It was the fourth severe loss to which this establishment has been subjected. The plant is being rebuilt.

The Kling Stove Company, Gallipolis, Ohio, suffered from the partial destruction of their molding shop November 5, but soon repaired damages sufficiently to resume work

Generally Interesting.

The Charter Oak Stove & Range Company, St. Louis, Mo., increased their capital stock from $50,000 to $100,000, the additional capital having been found necessary to meet the requirements of expanding trade.

Col. C. B. Boynton of the Boynton Furnace Company, New York, who acted as marshal of the stove and furnace manufacturers in the sound money demonstration in the autumn of 1896, was presented with a memento of the occasion consisting of the silk banner borne in the procession, inclosed in a richly trimmed black walnut case with a plate glass front.

The Gas Exposition held in New York in February brought out the best productions of the gas range manufacturers.

Anti department store agitation was quite a feature of the year. Retail hardware associations were organized in a number of States, designed to combat the growth of such stores as well as catalogue houses.

The great floods in the Ohio Valley in March caused some of the stove foundries in river towns to suspend operations until the water receded from their buildings.

The Sill Stove Works, Rochester, N. Y., established a distributing agency at Boston, Mass., to serve their growing New England trade.

The Charter Oak Stove & Range Company, St. Louis, captured an order for supplying the United States Government with about 1600 stoves, of which 1300 were cook stoves.

Buck's Stove & Range Company of St. Louis again awakened the trade by a huge advertisement in *The Metal Worker*, filling 16 pages in the issue for July 17. They followed this up in later issues by the staggering announcement that they would ship to Southwestern points on orders four train loads of 20 cars each. The trains were duly dispatched, but the number of cars was considerably exceeded. On August 26 the fourth annual banquet was given by the company to the St. Louis stove merchants, of whom nearly 150 were present. They received a silver medal for the most complete display of steel ranges at the Tennessee Centennial Exposition.

S. S. Jewett & Co. removed their Chicago branch to 1142-1158 West Sixteenth street, securing a most convenient location on one of the great railroad arteries of the city.

Frank A. Klaine, proprietor of the Good Will Foundry, Cincinnati, was the recipient in July of valuable tokens of esteem from his employees in commemoration of the twenty-fifth anniversary of his connection with the establishment. These consisted of a 30-drawer letter file cabinet, an easy chair and other useful articles.

The foundry department of the Tennessee main prison was leased to Duncan & Co., who are manufacturing stoves and hollow ware.

Shipments of Quick Meal Blue Flame oil stoves were made to Ireland and to the West Indies by John P. Lea, 239 Water street, New York, manager for Charles Noble & Co., Philadelphia.

The Michigan Stove Company's reputation for enterprise needs no outside assistance in the way of praise. A report of what they do, when stated in ungarnished words, extorts a feeling of admiration for their leadership. This year they brought out entirely new patterns of cooking goods, coming nearer to making a complete revolution in their line than has ever before been attempted in the history of the business. This would be a feat if it were done in a time of very good business and large profits, but it was undertaken in one of the dullest periods ever known in the stove trade, when everybody was economizing because it was impossible to perceive any indications of improving business. When the line was ready for the market it was perfectly in keeping with such an achievement to announce the fact in a mammoth advertisement covering 24 pages of *The Metal Worker*, which was done in the issue of August 14. This breaks the record for the largest single advertisement ever inserted in this journal. A silver medal, the highest award for any stove exhibit, was voted to them for their exhibit of Garland stoves and ranges at the Tennessee Centennial Exposition.

The Excelsior Steel Furnace Company, Chicago, manufacturers of furnace fittings, received more carload orders for their goods than in any previous year of the company's history.

The John B. Morris Foundry Company, Cincinnati, manufacturers of stove repairs, made the year a memorable one in their history by getting out a remarkably complete set of patterns for water backs, covering so many different makes of ranges that they are practically ready to meet any demand.

The Front Rank Steel Furnace Company, St. Louis, shipped two furnaces to Corea, one going via New York and the other via San Francisco, thus making the two furnaces encircle the globe in reaching their destination.

Rathbone, Sard & Co., Albany, N. Y., were obliged by the rush of orders the past year to open their shop No. 2, which had not been used since 1893.

The Detroit Stove Works have had an increased demand for their goods in foreign markets. In one month they made shipments to the Hawaiian Islands, South Africa, Belgium, Germany and Great Britain, and had an inquiry for gas stoves from Milatore, India.

James S. Lithgow, the veteran stove manufacturer of Louisville, Ky., celebrated his eighty-sixth birthday on November 29. Notwithstanding his great age, Mr. Lithgow is still actively engaged in business.

The exports of stoves from this country in the fiscal year ended June 30, 1897, showed only a slight gain on the preceding year. The value was $325,625, against $320,659 in the fiscal year 1896. The reports for the first nine months of this year, however, show a good increase over the same period of last year, the exports being $255,547, against $214,171 last year. Reports for later months have not yet been issued.

Technical Progress.

The Michigan Stove Company for the second time judicially established their right to what is known in the trade as the reflector top stove. The genuine reflector top has an inturned mica filled section having a reflector placed above it. The company brought out this year an entirely new idea in the Front Flue Oak Garland, which has proved a highly satisfactory stove. Letters from the trade state that this is the only stove thus far tried which is a full base heater and can be used for any kind of fuel.

C. W. Aldrich, Minneapolis, Minn., representing the Mississippi Valley Stove Company, obtained a patent on a heating stove designed to secure perfect combustion, economize fuel and thoroughly utilize the heat generated by the fire.

The Ringen Stove Company, St. Louis, after long experiments have succeeded in perfecting a process of enameling the fronts of their Quick Meal steel ranges. In this way a smoother, blacker and glossier front is obtained than by painting, and it will also stand much greater heat.

More stove manufacturers added steel ranges to their line of goods the past year, and the craze for sheet iron air tights or "tamales" caused considerable exploiting in that field. The regular stove manufacturers, however, departed considerably from the simple construction adopted by the pioneers in the air tight trade, introducing features adding to the durability of the stove.

Deaths.

The roll of departed members of the trade has been greatly lengthened in the past year. Many prominent names have been added by the dread messenger. Those who have come under our notice are as follows:

JANUARY.

James B. Rue, representative in Southern Michigan of the Peninsular Stove Company, Detroit, Mich. He had been connected with the company for ten years.

Charles Truesdale, Cincinnati, Ohio, for 40 years a member of the firm of William Resor & Co. Died January 14, aged 70 years.

FEBRUARY.

George E. Hopkin of Philadelphia, for several years secretary of the Abram Cox Stove Company, and an inventor of improvements in stove and furnace constr uction. Died February 7, aged 50 years.

William L. McDowell, president of the Leibrandt & McDowell Stove Company, Philadelphia. Died February 24, aged 73 years.

Alexander Morrison, for 40 years connected with Morrison & Son and Morrison & Tibbitts, Troy, N. Y. Died February 25.

Sherman S. Jewett, of S. S. Jewett & Co., Buffalo, N. Y. Died February 28, aged 80 years.

MARCH.

J. P. Lindemann of J. P. Lindemann & Sons, Milwaukee. Wis. Died March 17, aged 74 years.

Charles Eddy of Charles Eddy & Co., Troy, N. Y. Died March 19, aged 81 years.

APRIL.

Edwin S. Barbour, president of the Detroit Stove Works, Detroit, Mich. Died April 3, aged 64 years.

Jacob Weaver, for over 50 years member of the firm of Weaver & Volkmar, Philadelphia. Died April 14, aged 90 years.

Isaac De Haven, chairman of De Haven & Co., Limited, Pittsburgh, Pa. Died April 15, aged 59 years.

MAY.

Rolla A. Ullman, foreman of the Chicago Stove Works, Chicago. Died May 15, aged 40 years.

JUNE.

Thomas Holt, stove merchant, Philadelphia. Died June 7, aged 52 years.

JULY.

Washington Harris, an old time stove manufacturer, Philadelphia. Died July 10, aged 84 years.

George W. Demond, Plattsburg, N. Y. Died July 11, aged 66 years.

William Buck, Brantford, Ontario, Canada. Died July 15, aged 69 years.

George E. Priest, Boston, Mass. Died July 23.

James H. Van Alen, Peekskill, N. Y. Died July 25.

AUGUST.

Erastus Geer, Watervliet, N. Y. Died August 5, aged 73 years.

SEPTEMBER.

Francis M. Hunter, Spring City, Pa. Died September 5, aged 50 years.

H. H. Culver, St. Louis, Mo. Died September 26, aged 57 years.

NOVEMBER.

Wm. L. Bridgeford, Louisville, Ky. Died November 3, aged 50 years.

John Magee of the Magee Furnace Company, Chelsea, Mass. Died November 5, aged 76 years.

Frank A. Goetz, salesman for the Bridge & Beach Mfg. Company, St. Louis. Died November 20.

Frank M. Gies, director in the Co-operative Stove Company, Black Rock, Buffalo, N. Y. Died November 22.

Jonas Snyder, treasurer of Thomas, Roberts, Stevenson Company, Philadelphia. Died November 23.

Cornelius C. Lent, president of the Peekskill Stove Works, Peekskill, N. Y. Died November 26, aged 71 years.

DECEMBER.

John M. Graff of Graff & Co., New York. Died December 4, aged 62 years.

Solomon S. Detweiler, president of the Keeley Stove Company, Columbia, Pa. Died December 5, aged 64 years.

Geo. W. Eddy, at one time a prominent stove manufacturer of Troy, N. Y. Died December 5, aged 87 years.

The Furnace Trade.

The sharp competition in the heating field has had the effect of increasing the sales of all kinds of furnaces. More of the better class of goods have been used, owing to the disposition to reduce the cost of the more expensive buildings, consequently high grade furnaces and the best class of hot air systems have been used in place of more costly methods of heating. On the other hand, the disposition of those who erect cheap buildings has been to provide all the modern conveniences, including a heating system, and this has increased the sale of the lower grades of furnaces. Those who have made the higher grade of goods have been more successful in maintaining their prices, while the effort to increase the output of the cheaper class of goods has led to their sale at lower prices than ever before.

A new feature in the furnace field is the growing interest in the use of ventilating systems in connection with furnaces. More satisfactory heating in connection with them is claimed, owing to the fact that the flow of air to rooms that would otherwise be difficult to heat has been assisted by the ventilating system, which exhausts the air from them. The use of fans in connection with hot air furnaces is no longer a novelty, a large number of such heating plants having been installed in buildings in various sections of the country during the past year. The success of those in use has largely contributed to the extension of this method of furnace heating.

Opinions of the Trade.

The Cleveland Co-operative Stove Company of Cleveland, Ohio, in referring to the condition of business during the year just brought to a close say : There are many circumstances which work against the cast iron stove business, such as the almost universal use of furnaces in houses of a class which a few years ago we relied upon to be heated with stoves ; also the constantly increasing use of gasoline for cooking purposes, and oil, gasoline and gas for heating purposes, together with the increased output of steel ranges, the cost of producing which becomes materially less each season on account of the decline in the cost of material and the class of labor thereon employed, while the cost of cast iron stoves remains almost stationary. The margin of profit, as compared with last season, has not noticeably changed, but each year the tendency is rather toward a decreased margin. Collections compare favorably and perhaps are slightly better than last season, but not as much more favorable as the changed condition of business and money would lead us to expect. We are in hopes that there will be an improvement in the volume of business for the coming year —in fact, expect that such will be the case—but do not think there will be any noticeable advance in the selling price of commodities.

The Minnesota Stove Company, located at Shakopee, Minn., express the following views : We believe the volume of stove business in the Northwest has shown considerable improvement over last year, but the trade has evidently been spotted and better in some localities than in others. We find the sale of our high priced goods equally as good, if not better than last year, but are satisfied there have been large sales of cheaper goods—namely, air tights, &c. The demand for steel ranges and cooking stoves has been quite large, and we see no reason why it will not continue, although we are not looking for any phenomenal business the coming year, as we consider the volume in 1898 will largely depend on the crops which are yet to be grown, and therefore cannot be definitely calculated. Neither do we believe that prices will be any higher. In fact, we look for lower prices if there is any change at all. On the whole, we do not consider the outlook discouraging and intend to add some new goods to our line.

Charles C. Heath & Co. of Baltimore, Md., in discussing the situation, write as follows : The demand for low priced stoves prevails in our territory south of Maryland, but north of here they demand a better class of goods. There has been no relative change in the margin of profits as compared with last year. Collections are undoubtedly better. We anticipate a good trade the coming year, but can see nothing to lead to a higher basis of price or profit. We think that the tendency is to contract the limit of time allowed on credits, which is undoubtedly necessary, owing to the margin of profit being reduced over former years.

The Rutland Fire Clay Company of Rutland, Vt., who are in a position to feel the pulse of the stove industry, say : Our travelers visit retail stove dealers in 36 of the States, and we have found that business has been gaining, particularly during the latter half of the year, and as compared with 1896 this year's business will show quite a good increase. Collections have been remarkably good the last months of the year, and our travelers report that dealers generally are much encouraged in regard to the prospects for the coming year, and that almost without exception they say they are doing more business than for a long time.

The Michigan Stove Company of Detroit, Mich., among other things, say : The demand since 1892 has not improved for stoves of high grade. This we attribute to the conditions through which we have passed. The mechanic and those who purchase stoves, as a class, we all know, have not been fully employed, consequently they have not earned the same amount of money that they would have earned had they been employed all the time. Economy had therefore to be practiced not only in general lines, but in the stove line as well. There is no question but that the margin of profit is less, but so far as collections are concerned they have been very good. We cannot but conclude that there is a better prospect ahead, and believe, in volume, the trade will be increased. There is not, however, much encouragement as to prices reaching a higher level on some grades of goods.

A prominent stove manufacturer in the New England States, whose trade covers a wide territory, after referring to the unsatisfactory volume of business during the year just closed writes as follows : The tendency has been to purchase low priced goods. There has been some cutting of prices, but, generally speaking, those obtained would have been profitable, providing there had been sufficient business for running the plants fully. The loss of the parlor stove trade has been a serious blow to New England foundries. Of late years oil, gas and gasoline stoves, in addition to the increasing use of furnaces for small houses as well as large, seem to have taken the place of the parlor stove, so that the trade in the latter has shrunk to small proportions. As to collections, they have been slow enough, but that is a thing we get accustomed to in the stove trade, even in good years of business. We do not look for a great increase in volume of trade the coming year. If history repeats itself, it will take another year or two yet to recover from the panic of 1893. Probably the poorest business year the stove foundries of New England experienced after the panic of 1873 was in the year 1878, whereas 1879 was a profitable year. As regards an increase in prices the ensuing year, we see nothing to warrant such an expectation.

Schwab & Sercomb, manufacturers of the Gilt Edge warm air and combination heaters, Milwaukee, Wis., outline the situation as follows : The demand for goods of a high order has really not improved to any extent, but the tendency is to purchase low priced goods. This is greatly against the interests of the manufacturer in the line of heating devices. There has been no alteration in the margin of profit, and we find collections very slow—in fact, a little behind those of last year, we think. The prospects for the future look very assuring. Prices in heating devices will not reach a higher level, but we are of the opinion that the manufacturer will not give such extended credit, turning his money more quickly, which will give more profit. We have in the heating department of our works had a most successful year, having sold 40 per cent. more goods than the year prior. In iron interests we feel that there will be a hardening of prices, not only in iron, but in all material connected with the manufacture of iron. We do not look for any great advance, but should the producers of pig iron see fit to boom their product it would be quite a calamity.

The Baxter Stove Company of Mansfield, Ohio, say : We have sold more of the better grade of stoves and ranges this fall than we did last, the increase amounting perhaps to 20 per cent. There has been no material difference in the margin of profit over the last three years, prices remaining low. We believe the prospects for business next year are much better than they have been for the last three years, but we do not expect better prices. There is certainly a better feeling among dealers. They are paying their bills more promptly and the fall trade has been fully up to our expectations.

The Standard Lighting Company of Cleveland, Ohio, outline the situation as regards oil, gas and vapor stoves as follows : The list prices and discounts on vapor stoves remain the same as last year, notwithstanding the fact that there has been a considerable advance in some of the materials used in their manufacture Our collections have been very satisfactory all through the year, and we think they are somewhat better than they were a year ago. Our fiscal year closed August 1, and up to date our trade is more than double that of last year The outlook for the coming year is very prosperous, and we would not be at all surprised if we were enabled to double our sales of last year. There seems to be a larger demand for our line of goods, both gasoline, oil and gas stoves, for the reason that the stocks in the hands of the dealers are depleted on account of their small purchases during the past year.

The Atlanta Stove Works of Atlanta, Ga., write as follows : During July, August and September of this year trade was all that we could ask for and at fairly remunerative margins of profits. The breaking out of yellow fever in Louisiana, Mississippi and Alabama prevailing in September, October and November practically destroyed the business of those States for this season. The prolonged warm weather has also retarded sales, and the low price to which cotton has fallen has practically stagnated business. The low price of cotton always brings a demand for low priced stoves, in which there is no profit, and this tendency to produce low priced goods will continue at least until there is an advance in the price of cotton. Collections are also flat because of the above mentioned conditions. Viewing these facts as they now exist, we see nothing of encouragement, at least for the beginning of the new year. We have been forced to curtail forces both on the road and in the factory, and we believe that another crop must be raised before there can possibly be much improvement. We are naturally optimistic. The outlook as we see it causes us to take a position about midway between optimism and pessimism.

W. H. Barnard & Co., manufacturers' agents, Norfolk, Va., in reviewing the business for the past year refer to the noticeable demand for other than high priced stoves. They say : In this connection and in others, as we find from inquiry, the demand for the sheet iron air tight stoves for wood has not abated; on the contrary, the sale of them has largely increased over previous years. We regard this as a misfortune, because it certainly results in a loss of profit to the stove dealer, who misses the sale of

higher priced cast iron goods and a consequent loss of repairs. We consider that the trade of the stove and hardware dealer has suffered seriously from competition from installment houses and department stores. We think that there should be a national association of retail stove men to look after their interests, as is done by the Master Plumbers' Association, for unless they organize for protection their interests will continue to be encroached upon. We believe that the distress which to a large extent prevails among the retail stove dealers is due to the fact that they have no organization for mutual protection and defense. In our judgment the organization of such an association is imperative. We shall enter a new year very conservatively. We do not anticipate for the coming year business of a much different character from that existing in the last two years. We see no reason to suppose that prices will range higher for the coming year.

The Toledo Stove Company of Toledo, Ohio, referring to the business of the past year state that it has been double that of any other year and with fair prices. They say that as far as collections are concerned, "they have been much better than for any previous year. We consider the conditions for next year to warrant a steady and regular business, but do not think there will be any great flourish; rather it will drift along quietly and agreeably. During the past year we have worked overtime and run to the fullest capacity, and at the time of writing have only lost two heats in working days this year, July 4 and Labor Day."

TRAVELING STOVE SALESMEN FOR 1898.

The Magee Furnace Company of Boston, Mass., have arranged with S. Olin Field to look after their interests in the Western and Middle States; S. E. Newell, Alfred T. Stockbridge and T. R. Andrews will cover the New England States; Lott & Farquharson will represent the company in Chicago, Ill.; Rood & McIntyre in Kansas City, Mo., and Mangrum & Otter in San Francisco, Cal. The heating and ventilating departments for the installation of new work is in charge of Frank E. Woodward and a corps of able assistants. W. C. Higgins, formerly manager of the Richmond Stove Company of Norwich, Conn., will have supervision of the construction and sales departments in the steam and hot water line.

A. T. Nye & Son of Marietta, Ohio, will be represented by A. T. Nye, Jr., who will cover Ohio, Indiana and Illinois, and Ed. Highland, who will visit the trade in Virginia, West Virginia and Kentucky.

Bergstrom Brothers & Co. of Neenah, Wis., have arranged with C. S. Youngs to look after their interests in Wisconsin and Upper Michigan; R. J. Bird in Iowa, Minnesota and South Dakota; F. W. Lucas in Minnesota, South Dakota and North Dakota, and George H. Loy in Iowa and Western Illinois.

The Indiana Stove Works of Evansville, Ind., announce that their traveling salesmen for 1898 will include F. O. Headley, who will visit the trade in Missouri and South Iowa; W. H. Brennecke in Illinois; W. F. Karges in Texas; A. H. Roekler in Arkansas, Tennessee and Southeastern Missouri; E. C. Specht in West Mississippi and Louisiana; A. J. Schulz in North Iowa, Minnesota and Wisconsin; R. F. Corbyn in East Kansas, Nebraska and South Dakota, and J. E. Adkins in Alabama and East Mississippi.

The Kernan Furnace Company of Utica, N. Y., have arranged with the following salesmen to look after their interests in the territory indicated: W. S. Reed and Charles R. Morgan will cover the West; C. H. Fresher the States of Michigan, Ohio and Indiana; New York and the Eastern States will be covered by John A. Breen, while their Eastern branch, as formerly, will be located at 105 Beekman street, New York City.

The Henry N. Clark Company, Boston, Mass., have arranged with the following staff to look after their interests in the territory named: L. M. Barnes will cover Connecticut and Western Massachusetts; J. W. Denny, Maine and New Hampshire; T. W. Burden, Eastern Massachusetts and Vermont; C. W. Wheelock, Boston and vicinity, and A. G. Gillespie will have entire charge of their Bicycle department and travel in the leading places in New England in the interest of the same.

Benjamin F. Goodrich.

Benjamin F. Goodrich, proprietor of the Electric Oil Stove Works, at Homer, Mich., died December 21 of pneumonia. He was 52 years old and was the most prominent citizen of the town, enjoying a wide acquaintance in other parts of the country through his business enterprises. In 1895 Mr. Goodrich was a prominent candidate for the Congressional nomination in the Third District of Michigan. He was president of Homer village for three successive terms. He was a prominent Mason and a member of Marshall Commandery, Knights Templar, which order conducted the funeral services. Mr. Goodrich was born in Saline, Mich., December 20, 1845. He removed to Homer in 1875 and engaged in the hardware business. He then started the manufacture of bathtubs, and about ten years ago he commenced the manufacture of the electric oil stove. This industry grew until, it is claimed, it became the largest factory of its kind in the world. He leaves a widow and two children.

ODD PLATES.

The latest postal card sent out by the Gobeille Pattern Company, Cleveland, Ohio, is a combination advertisement and Christmas greeting, the whole encompassed with a golden atmosphere.

The Monarch Stove & Mfg. Company of Mansfield, Ohio, have established a number of agencies for the sale of their goods during the season of 1898, and we give below a list of those with whom arrangements have already been completed. They will be represented in the Eastern markets by A. L. Canfield, 284 Pearl street, New York City, who has charge of the New York office; by J. C. H. Lynn of Philadelphia, Pa., who has charge of the Philadelphia office, and the Danvile Stove & Mfg. Company of Danville, Pa., who will look after the trade in Central and Western Pennsylvania. The trade in Nebraska will be looked after by the Hall Stove & Range Company of Lincoln, and that in Missouri and Kansas by the Zahner & Battelle Mfg. Company, Kansas City. The State of Minnesota and the Dakotas will be taken care of by G. W. Cahoon, who has charge of the company's branch house at St. Paul, and Western Pennsylvania will be covered by R. E. Edmonds, who will have charge of the branch house at Pittsburgh, where a stock of goods will be carried. Southern Ohio will be covered by R. W. Ross & Son, the general State of Ohio by Charles E. Bartenbach, who has been with the company for the past ten years, and the State of Michigan will be covered by C. W. Kroosz, who represented the company in that territory last year.

Where the practice of the Michigan Stove Company will lead them if they keep on sending out more and more valuable souvenirs we cannot tell, but we do know that the trade most heartily appreciate the beautiful and serviceable gifts, for they are more than advertisements, which this company distribute. There comes to us with the compliments of the season the prettiest sort of aluminum match box which has evidently been designed by some one who understands the requirements of the case. The match box is of the proper size, neither too small for the larger sizes of parlor matches nor so long as to be clumsy. The corners are rounded so it will not wear the pocket, and the finish is in every particular most carefully and neatly done, while of course the lightness of the material is a very great advantage. We are not told how generally the Michigan Stove Company are distributing these souvenirs, but we do know that every one of their customers, not to mention others, would be very glad of a sample.

The Metal Worker acknowledges the receipt of an invitation to attend the annual banquet of the North Second Street Stove Dealers, at the Bourse, Philadelphia, December 30, 1897. The success of the affair was assured by the committee in charge, composed of W. G. Withers, H. F. Tyson and W. F. Habicht.

Among the important events of the past year is the erection of a modern foundry and machine shop plant by the Walker & Pratt Mfg. Company of 31-35 Union street, Boston, Mass., manufacturers of the Crawford Ranges, whose advertisement in this issue shows a general view of the new buildings. This plant is now nearly ready for occupancy. It is up to date in every respect, having every modern improvement for improving the quality of the product. Not the least of its advantages is the abundant light which is everywhere available, there being more than 12,000 lights of glass. This plant is being equipped with overhead track for carrying heavy loads through the foundry and more important buildings. The

cupola is served by a complete system of narrow gauge cars. The works are lighted with electricity throughout. At a later date we hope to present to our readers a further description of this factory.

We are indebted to the Shields Foundry Company, Incorporated, Mansfield, Mass., for an exceedingly neat calendar for the new year. The main part consists of a 9 x 11 white card with serrated edges and ornamental corners, and provided with a blue silken loop for hanging it upon the wall. The outer portion of the card forms a border to a central panel carrying a picture in colors. Around the top of the panel are the name and address of the company, together with an indication of the lines of goods which they manufacture. Suspended from the bottom of the card by means of silken loops is a smaller card bearing the leaves for the various months of the year. These are printed in black upon a white ground, and give in addition to the days of the week and month the various phases of the moon. There is also a yearly calendar which will be found of general interest in the same connection.

A calendar for the year 1898, which in design is well calculated to serve the double purpose for which it has been issued, is that sent out by the Co-operative Foundry Company of Rochester, N. Y. Attached to a heavy black card with beveled gilt edges are the leaves constituting the calendar for the 12 months of the year. These leaves measure nearly 10 inches square and are cut to represent a Maltese cross, which stands as a conspicuous feature of the trade-mark of the Red Cross goods. The leaves are red in color and carry in white letters and figures the days of the week and month. At the bottom of each leaf are the names Robinson & Sons, Chicago, Ill., and Lindemann & Sons, Milwaukee, Wis., these being agencies for the Red Cross goods in the sections designated. A loop of gilt chain running through two eyes in the top of the large card serves as a means for hanging the calendar upon the wall.

W. H. Colebrook of W. H. Colebrook & Co., Syracuse, N. Y., will have the sympathy of a wide circle of friends in the death of his venerable father, Charles Colebrook, which occurred on the morning of December 26, at his home in Syracuse. Mr. Colebrook was born in Biddenden, Kent, England, nearly 87 years ago. He came to this country when a boy of about 20 years, settling in Charlton Village, N. Y., where he remained for a few years and then moved to Amsterdam, N. Y., where he lived until 25 years ago, when he removed to Syracuse. For the past five years he has been out of active business on account of failing health.

The Magee Furnace Company of Boston, Mass., have extended their already large line of Cooking and Heating apparatus by the addition of a Steel Range, a new two-flue Range called the Shawmut, the Magee Boston Heater, "A" Series, and a full line of Hot Water and Steam Heaters. These goods will shortly be brought to the notice of the trade through their traveling salesmen and announcement in other columns of this journal.

Advices from the South are to the effect that the men who went out on account of a cut of 10 per cent. in their wages by the Atlanta Stove Works, Atlanta, Ga., decided at a recent meeting to reject the new scale of wages. Alexander S. Seals, vice president and general manager, in speaking of the matter is reported by the Atlanta *Constitution* to have said: "The men quit because we cannot now afford to pay them the wages we did when our business was brisk. The yellow fever kept our men out of the infected districts, where we had a large trade. Our orders from this source have been cut off. The warm weather during the autumn has been such that people have not needed as many Stoves as usual, and low cotton has kept our products out of the country districts. We cut the wages for these reasons. If the men want to come and work for what we offer they can do so, otherwise we do not need them, and they can remain out as long as they like. We have a few men who will make our force as large as necessary. Only recently we reduced our number of workmen from 35 to 20, and we can do without them until our trade improves. Some of the men wanted to lend us a part of their wages, but we did not wish to borrow, preferring to keep down expenses. That is the situation as we see it, but we are sorry we cannot employ all the men at the regular scale of wages."

The Fuller & Warren Company, Troy, N. Y., advise us that they have just received a diploma from the Rutland County Agricultural Society, Rutland, Vt., dated September 14-16, 1897, reading: "Highest Award to Fuller & Warren Company, Troy, N. Y., for Exhibit of Stoves and Ranges."

A small fire in one of the frame buildings of the Lebanon Stove Works, Lebanon, Pa., caused considerable excitement for a short time one day recently. The entire fire department responded to the alarm, which was sent in from a private box at the corner of Eighth and Water streets about 7 o'clock. The flames, however, were under control before they gained any headway, and the damage was consequently of little account.

The Monarch Stove & Mfg. Company of Mansfield, Ohio, have a new catalogue in the hands of the printer and expect to be able to distribute it among the trade by the 15th inst. They also have in contemplation a number of new goods which they expect will keep the Monarch at the front of the procession, and are preparing for a very large increase over the past two or three years' output.

A Brooklyn clergyman was compelled to announce to his congregation on last Sunday that they had better retire while singing a hymn, as there seemed to be a fire in the basement that was not of a serious character. The trouble was due to hot air pipes from a furnace being placed too close to the wood work. On drawing the fire and removing the pipes the firemen found their work completed. From this it would seem that the old method of piping furnaces is open to improvement, even though there are thousands in use under exactly the same conditions that never interfered with the devotions of a congregation.

The Atlanta Stove Works of Atlanta, Ga., are favoring their friends in the trade with a calendar for the new year in the shape of a poster embellished with a very pretty design lithographed in colors. The poster is provided with metal strips at top and bottom, and has a metal eye for hanging it up. The leaves for the different months of the year are attached to the lower right hand corner, the printing being in deep blue upon a white ground. The various phases of the moon are given in connection with the days of the week and month.

The Mississippi Valley Stove Company, manufacturers of Solar Stoves and Ranges, are distributing a very pretty wall calendar. It consists of a card 9½ x 13 inches in size, in the center of which appears a rural scene in colors. Flowers are embossed in colors around the border, which is also decorated in open work. The calendar itself occupies a small space at the bottom. A ribbon is supplied for hanging it. Those who received the company's Phœbe calendar last year and thought that a work of art will be just as highly pleased with this year's beautiful reminder, although it is of a different type altogether.

The Mayer plating dynamos manufactured and sold by Maxwell M. Mayer, 335 107th street, East River, New York, are illustrated and described in a neat pamphlet which Mr. Mayer is distributing to the trade. A general description of the dynamos is given and a half-tone engraving illustrates the interior of his works. At the back are testimonial letters and prices of nickel plating outfits.

The interest in the class in electrical work at the New York Trade School has been remarkable this year. A class of 50 is receiving instruction, though there were 90 applications. On December 28 a lecture was given in the Trade School Auditorium on "Some Interesting Facts About Electricity," by Arthur A. Hammerschlag.

A suit has been begun in the United States Circuit Court of New York against the Standard Oil Company and others by the United States Pipe Line Company of Pennsylvania, charging conspiracy to crush out competition and asking for $350,000 damages. The complainants allege that a conspiracy has been in existence since January, 1882, to prevent any persons or corporations other than the defendants from storing or transporting oil and conducting operations relating to that business. They further complain that the Standard Oil Company by intimidation have prevented merchants from dealing in oil transported by the complainants, and have sold oil at ruinous prices in the markets where oil transported by the complainant company was offered for sale. Among other points, it is related that the Standard Oil Company, in order to keep out competition, frequently chartered all of the available oil vessels regardless of the number needed for their own business. The defendants in their answer make a general denial of the charges and intimate that the Pipe Line Company were not organized for the storage and transportation of oil as a common carrier.

The coal mining companies in Japan are introducing Corean laborers into their mines, finding them more able to stand hard work and more amenable to discipline than the natives.

The Globe Shipbuilding Company, Cleveland, Ohio, have secured control of the Shipowners' Dry Dock Company of that city, a concern capitalized at $380,000. The Globe Company have purchased $250,000 worth of the stock.

HEATING AND PLUMBING.

The Steam and Hot Water Heating Trade.

A large number of letters from manufacturers of steam and hot water heating apparatus and appliances give evidence of an increased production for the year just closed, but unfortunately these letters also report, almost without exception, that the business has been done on a narrower margin of profit. The business in prospect for the New Year gives promise of better things. Our correspondents report that they find architects engaged with work that is to be carried out, and already there is some reason to believe that the demand may be more in proportion to the production with a corresponding benefit to prices and profits. What is true of every year since '93 is true of the year just closed. Competition has been sharp. During the last half of the year business was better, and this with the increase in demand natural to the fall season relieved the competition somewhat by occupying the trade and put things on a more satisfactory basis. The opinions as to collections vary, with some show of improvement, however, particularly in the West, where good crops were disposed of at good prices. We print below extracts from a few of the letters we have received :

The S. Wilks Mfg. Company, Chicago: Our business has been in excess of 1896. The margin of profit has been less, as there has been no decrease in the cost of material, and during the latter part of the year there has been an advance in steel, rivets, &c., and competition has been strong in all goods in our line. Collections have been fairly good until nearly the close of the year when they dragged considerably. In figuring up their year's business we think many parties, particularly in the plumbing and heating line, will not find much, if any, profit, as there has been a very strong competition among the different plumbers and fitters, and many jobs have been taken too low. There seems to be a large amount of building thought of for the coming year, the fulfillment of which will depend largely on the condition of the labor market. If there should be any strikes they will stop a large amount of prospective building.

The John Davis Company, Chicago: The past year's business has in almost all respects been better than that of the preceding year. The profit has been about the same, though there have been attempts made to improve conditions during the year, and on the whole prices may have been somewhat better. To us it appears that the prospects for the coming year are good.

Thomas Devlin & Co., Philadelphia: We regret as much as anybody can the fact that the year drawing to a close has been a very bad one for profits in our line of business.

One of the leading manufacturing houses in the country write: Relative to the future we can only guess. We are well satisfied that what the country needs is rest from political agitation, but it does need to have the currency question settled on a sound basis. These satisfactorily disposed of we should look for a considerable stimulus and demand for goods, but we can hardly see any reason why there should be a very much higher level of prices.

Boilers.

An accurate report of the number of boilers sold, if it could be obtained, would probably show an increase of 15 or 20 per cent. over the preceding year, and yet it is doubted if the amount of these sales in dollars and cents would be as great. Among the reasons for this condition is the large number of small boilers that have been brought out during the year, and which, owing to the sharp competition, have been used instead of the larger and better adapted boilers used in the past. This has all tended to reduce profits, and in the effort to cut down the cost of doing business the salesmen have felt the hand of retrenchment, although their labors have increased. The following letters present the views of some of our correspondents:

The American Boiler Company, Chicago: There has been a large increase in the volume of business and our orders equal those of '95. Collections have been fairly good and we look forward to a decided increase in business for the coming year. Prices are much lower than a few years ago, but there is a larger amount of business to be obtained.

John Best, Lancaster, Pa.: Business this year is no better than '96. If anything we have been working on a closer margin of profit than ever before. The outlook for the coming year is encouraging. We have a few nice orders in already.

Morgan & Co., Chicago: Of one thing there can be no doubt, the price of the ordinary boiler has come to a point where it cannot be lowered, if there is no reduction in the price of the materials of which it is made. We think that there has been a material reduction in the cost of marketing boilers. The boiler man is becoming more conservative in making prices, and, on the whole, everything points to more prosperous times.

The Gurney Heater Mfg. Company, Boston: Our experience leads us to the conclusion that business for the past year was largely confined to heating buildings already in existence, whereas the expectation regarding the future is that house building will be resumed at no very distant date, and that the present intense competition will be mitigated by the demand coming somewhere near to the supply.

Radiators.

The amount of radiation sold during the year was greater than the amount distributed during the year preceding, but from the reports at hand the prices secured were not altogether satisfactory, the margin of profit being narrower. The influence of manufacturing plants that were got into good running order during this year for the first time was felt when the marketing of their product began. These plants, as well as the old plants, report an increased volume of business, and all seem to agree that the prospects for the coming year are encouraging, although an advance in price is not expected during the early months. From letters received, we quote as follows:

The United States Radiator Company, Dunkirk, N. Y.: Our business has been larger in volume during the year 1897 than at any time during the history of our company. Prospects for another year seem bright, and while we are not expecting any radical change in prices, we believe that if any occurs it will be in the nature of an advance to cover the increased cost of raw materials.

The Fowler Radiator & Mfg. Company, Johnstown, Pa.: We are pleased to state that the volume of our business for the year closing has been at least 50 per cent. more than for the year previous. Collections also have been somewhat easier, although there is still room for considerable improvement in this line. The prospects for business the coming year, we think, are very favorable, but do not anticipate any material advance in prices in our line. Any increased margin of profit, we think, will have to be made by cutting down the cost of manufacture.

The Holland Radiator Company, Chicago: We have had a most satisfactory year in every respect. Our collections have been satisfactory and our works have been taxed to their utmost in filling orders. Prices have been low, but we hope for better next year. From all indications we expect an excellent trade for '98.

A large Western house say: More radiation was sold in '96 than in any previous year in the history of the trade. The conditions under which the business was done have made the prices, on the whole, unsatisfactory, with no immediate prospects for an improvement.

Another large house say: Our output has been increased, but the competition has interfered with the profits. We made a special effort on our best goods, on which we secured better prices.

Steam Specialties.

The various productions known as steam specialties, as well as standard supplies, have met with an increased sale, but in the sharp competition for business prices have ruled lower, with a corresponding effect on profits. Some effort has been made during the year to advance prices, and in some lines it has been successful, but in others the effort was not well sustained. A number of houses have entered the field as selling agents, and in handling several lines have reduced the cost of selling to the manufacturer. The low prices on standard goods have caused a greater effort to be made to produce specialties that would earn a profit, and a number of new appliances have made their appearance. Some of our correspondents express themselves as follows:

The James P. Marsh Company, Chicago: The volume of our business for 1897 has been at least 25 per cent. better than in 1896. The net profit has not increased. We consider the prospects for 1898 extremely good.

The Frontier Iron Works, Detroit, Mich.: Our brass valve trade has largely increased during the past year. There has been no material change in prices, although perhaps they have been a little closer and the margin of profit smaller. We do not expect prices to go much higher next year, but we do look for a good business.

Bartlett Brothers Company, Cleveland, Ohio: We find trade better than last year, and look forward to a better business next year, as public buildings and schools have been neglected during the late financial depression, but cannot be neglected any longer.

Beaton & Corbin Mfg. Company, Southington, Conn.: The first three months of last year were a little better than the corresponding months of this year, but since July 1 the trade has been one-quarter better. Prices have held about the same, and the prospects for improvement in the trade are good.

Collections and Failures.

A closer scanning has been given this year to the financial responsibility of the buyer, and the effect has been that many losses have been avoided and the number of failures for the year has been smaller. This has also had the effect of improving collections, and although during the dull seasons money was slow in coming in a very satisfactory improvement was felt during the late fall months.

John Davis Company, Chicago, write: There is a very marked difference in collections, and at the present time country collections are better than they have been at any time since the present depression began.

A prominent New England house say: There is no difference in collections which can be called unfavorable. So far as we are concerned, collections may be said to be good, and losses during the year just past seem to be reduced to the minimum.

Foreign Trade.

There has been a very substantial increase in the amount of goods shipped abroad, and a larger number of business houses now have foreign customers to whom regular shipments are made. The shipments include boilers, radiators, valves, pipe, fittings and tools. Some houses maintain branches abroad, and several have arranged with foreign dealers as agents. Special trips have been made to investigate this field for business, and it has been found that our goods are well adapted for the market, a strong preference having been shown for those of the best quality.

The Associations.

The American Society of Heating and Ventilating Engineers held a very successful meeting in January, and under the administration of W. M. Mackay, the president elected, a midsummer meeting was held. A large increase in membership will be reported at the next annual convention to be held January 25-27, 1898, which already gives promise of being very interesting.

The National Association of Master Steam and Hot Water Fitters has maintained a headquarters in the Wool Exchange Building, New York, which under the efficient management of Secretary Henry B. Gombers has been a great benefit to the members during the close of the administration of President Arthur C. Walworth and under the present administration of President E. D. Smith. In New York City the local association is, in co-operation with the local Master Plumbers' Association, making an effort to secure better trade protection.

The Plumbing Trade.

The year in the plumbing trade has been unsatisfactory, so far as is recorded by the balance sheet. The scarcity of business which marked the opening months so affected prices that goods which were formerly standard were entirely supplanted by productions of a higher grade in appearance, convenience and quality. The reports at hand from a good representation of the trade show that the last half of the year brought an improvement in collections and an increase in the volume of business, but unfortunately the prices failed to keep pace with the other improvements, so profits were most unsatisfactory. Other notable features of the year have been the increasing interest in trade protection and in legislation to raise the character of plumbing work done in all kinds of buildings to the level of modern sanitary requirements.

The Associations.

The annual convention of the National Association of Master Plumbers, held in New York in June, was well attended. The next convention will be held at a time to be set by the National Executive Committee at San Antonio, Texas. The officers are:

President, Thomas P. Culloton, Chicago.
Secretary, J. G. Roland, Chicago.
Treasurer, Wm. E. Goodman, Milwaukee.

There are three associations of manufacturers of plumbing goods for the purpose of protecting their interests in credits, collections and uniform prices and trade concessions. Their interests are centered in Chicago, New York and Boston, and known and officered as follows:

THE CENTRAL SUPPLY ASSOCIATION.

President, Alfred Fowle, Jr., Milwaukee.
Secretary, Geo. F. Ross, Chicago.
Treasurer, W. E. Clow, Chicago.

THE EASTERN SUPPLY ASSOCIATION.

President, B. Frank Hooper, New York.
Secretary, E. W. Lowe, New York.
Treasurer, W. C. Trageser, New York.

THE NEW ENGLAND SUPPLY ASSOCIATION.

President, Frank J. Knox, Hartford, Conn.
Secretary, John B. Dupee, Boston.
Treasurer, W. L. Whittemore, Boston.

Trade Protection.

The small profits and sharp competition of the year have brought home to the plumber the necessity of selling all of the material he works and greater interest has

been taken in trade protection. Elaborate propositions have been compiled and presented to the wholesale trade, and the close of the year finds the subject still under harmonious discussion.

Sanitary Legislation.

Throughout the country greater attention has been given to the enactment of laws to secure sanitary plumbing. Bills were introduced in the legislatures of several States last winter to provide for the regulation of plumbing work and for the examination and licensing of competent men. In some States they became laws and benefit has attended their enforcement, while in others they failed, but the efforts will be renewed in the legislatures about to convene.

In Massachusetts a law was passed applying to the city of Boston requiring that gas fitting must be done by licensed gas fitters and subject to official inspection.

Extracts From Letters.

From a great number of letters received from the trade we present extracts from a few, as follows:

Monitor Iron Works, New York: While business with us has been larger in tonnage, it has been very much smaller in value received this year compared with last. The margin of profit has been materially reduced since last year. Collections have been fairly good, compared with last year. As to future prospects, no fellow can find out to a certainty. The prospect is by no means good in our trade. Overproduction and no foreign outlet seems to confront us. While these conditions remain no large advance in prices is at all likely. Prices to-day are lower than ever before in our goods.

Henry Huber Company, New York: Business this year has shown an improvement over last, but we attribute this more particularly to the fact that we have made extra efforts. Prices as a rule are lower even than they were in 1896. We anticipate in the year 1898 it will be better, but we have no hopes of material improvement in prices.

Hays Mfg. Company, Erie, Pa.: The opening of the year 1897 found trade very light, business in general throughout the country was quiet, and as a result what little could be brought about was the result of objects in price more than actual need of goods. Toward the middle of the season a change for the better was noticeable, prices, although remaining low, were held more firm and the trade placed confidence in the turn of affairs in a material way. Later during the year improvement was well marked and the influx of business was very gratifying. Many of the towns and cities have been pushing to completion long delayed municipal improvements, which has given impetus to our particular class of goods, and the open, favorable weather continuing throughout the entire fall has carried the good results well to the close of the year and has put us considerably behind our orders, making it necessary for us to run day and night and with increased forces of men in order to make some headway. The last three months have shown an increase of over 50 per cent. covering the same period last year. To us the year 1898 is very promising, owing to the municipal improvements now in contemplation and that have been carried along awaiting trade revival. And with this better feeling will no doubt come a restoration of living prices and the demand for good material—quality not quantity will be given the preference.

The Day-Ward Company, Warren, Ohio: The year now closed has been a fairly prosperous one in our line of business. The amount of goods used has been greater than in any previous year of our experience, and while the margin of profit has been smaller the increase of business has, perhaps, offset this to a large extent. In regard to collections we think that perhaps during the last quarter of 1897 they have been a little slower than in the previous nine months, but we consider them fairly good, everything taken into consideration. In regard to the coming year the outlook seems to be good for a large volume of business, and there seems to be a general expectation by both manufacturers and dealers that higher prices will prevail and that the margin of profit, which has been reduced by the strong competition, will be increased. Our own opinion is that the coming year will see a somewhat higher range of prices, although we believe that the strong competition in the manufacture of plumbing supplies will prevent anything in the nature of a boom, and that any advance which may come will be legitimate and will be largely brought about by the increased consumption.

H. Mueller Mfg. Company, Decatur, Ill.: Our business the first part of the year was no improvement over last year. We find that the last few months has been very much better than the same time last year, and, taking it as an aggregate for the year, our business will show some improvement over last year, but we hardly look for much better profits this year, as prices have been demoralized for some time and it will take time to advance prices. Still, we are confident that prices will be higher next year. This is a fact, as you cannot contract for goods to be delivered during the year of 1898 for the same price at which you could purchase goods for this season. We consider prospects for this coming season very bright and a great deal better than for some time past. We think there will be much more public improvement, such as construction of water works and extension of water works, than for some years, as money is much easier, and therefore it will be easier to sell bonds in order to make public improvements. We find collections much better than last year at this time.

Charles Millar & Son, Utica, N. Y.: Business this year has been somewhat disappointing. It is about the same as it was in 1896 and, while the conditions seem favorable, the volume has not been materially increased. In some sections of our territory our customers complain much more than they did during the previous year, but in other sections there has been a noticeable improvement. Collections on the whole, we think, are better, and there have been fewer failures, but still they are sufficiently numerous to make it advisable to exercise great discretion in granting credit. We think the prospects for the coming year are good and we expect before the year is over to see extremely prosperous times. We may be disappointed in regard to this, but unless some foreign complications arise are quite sure that there will be a great improvement.

Instantaneous Water Heating Company, Chicago: Our sales this year will exceed those of last fully 30 per cent. The last three months have been particularly encouraging and our sales for November of this year were the largest in our history for that month. The margin of profit on our goods has practically remained the same and our collections the past few months have been most satisfactory. We are of the opinion that the year of 1898 will be the most successful one that our manufacturers and merchants have experienced for a long time, and feel confident that such will be the case.

Illinois Malleable Iron Company, Chicago, Ill: While business in the early part of the year was not encouraging in its volume, during the past few months there has been a decided and notable improvement in the condition of trade, and we are sanguine about the future. We base our opinion on the fact that the improved prices now ruling for farm products bring better times to the farmer, and in the redistribution of the surplus the farmer will accumulate the entire commercial world will share. We therefore believe that the coming year is full of hope, and that business transactions will be greater in number and of larger volume than in the immediate past.

Naugatuck Mfg. Company, Naugatuck, Conn.: We have found business improving through the past year, particularly during the last three months. As to the matter of margin of profit, we do not see any increase in that yet, but we notice that collections are improving, especially September, October and November. We do not look for any advance in prices on the articles we manufacture, but are hoping, and we trust with good reason, for an increase in the volume of our trade, and in anticipation of an increase of business we are increasing our facilities for handling it.

King Mfg. Company, West Troy, N. Y.: We have had an encouraging increase in the volume of our business during the past year, with no appreciable difference in the margin of profits. Collections are made with difficulty, showing little if any improvement over last year. Still, there can be no question but that the general condition of trade shows a marked improvement, and we look with confidence to the coming of an era of more abundant prosperity.

W. & B. Douglas, Middletown, Conn.: We have found business in 1897 about the same as the previous year with us. Prices are very low and the margins of profits are considerably reduced. We think that the coming year will be a more profitable one in every way, as the confidence of the people in the Government is gradually being restored and the currency is now on a pretty solid footing, if Congress will only leave alone any ideas as to the banking department of the country. There is one thing that ought to be understood, that the manufacturers of this country are selling their goods too cheaply to-day, and the evidences all about us are that the largest manufacturers will have to go into a combine so that they can sell their products and afford a fair margin.

State President Tute at Worcester.

An enthusiastic and well attended meeting of the master plumbers was held in the Builders' Exchange, Worcester, Mass., Tuesday evening, December 21. Among the special attractions of the evening was the presence of Thomas J. Tute, president of the State Association, who stopped in Worcester *en route* for his home in Boston, after a week of missionary service in Westboro and Springfield. President Tute gave an interesting report of the work that the master plumbers are doing in Massachusetts and in other States, and spoke at length with regard to the measures that are now being seriously considered by the several State organizations and the National Association.

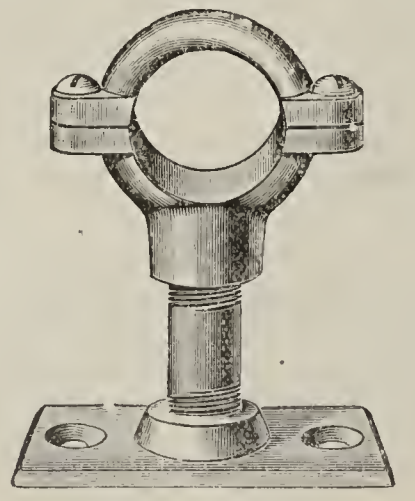
Following the talk by Mr. Tute matters of interest to the master plumbers were discussed. The plumbers are greatly interested in securing a uniformity among the manufacturers who sell plumbers' supplies, and to prevent the wholesalers retailing and thus injuring the regular retailers. The master plumbers are looking forward to the State convention, which will be held in Taunton, January 13. One of the advantages of the plumbers' convention is that every recognized plumber is a delegate in himself, and no formal elections of delegates by the various associations are held. Several from the Worcester branch are planning to attend. The annual election of officers of the Worcester Association will be held February 1.

Chicago Master Plumbers' Association.

At the meeting of the Chicago Association of Master Plumbers, held on Tuesday, December 28, J. J Wade was elected president. The other officers chosen included vice-president, Charles J. Boyd; secretary, Samuel Smith; treasurer, Thomas C. Boyd, and sergeant-at arms, Joseph Scheuer. Messrs. Smith and T. C. Boyd were reelected. The other members of the Executive Committee, which embraces the president, vice-president, secretary, treasurer and the retiring president, Thomas Conlin, are Paul Redieske, Charles J. Byrne and D. J. Tierney. The election of Mr. Wade to the presidential office was a long delayed honor to an old wheel horse who has served faithfully and untiringly in the cause of sanitary advancement.

Extension Pipe Hangers.

In the accompanying illustration we show one of the varied line of pipe hangers for brass and iron pipe made by Fee & Mason, 66 Beekman street, New York. This

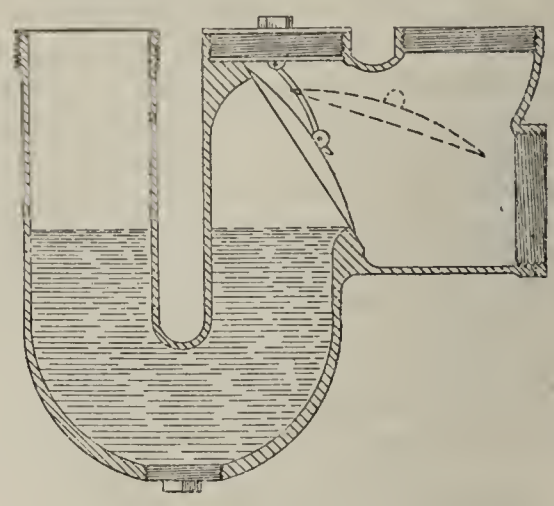


Extension Pipe Hangers.

hanger consists of a pipe clasp, a nipple and a plate, designed to be secured to the building. The plates are made with two or three tapped openings for double and triple hangers when desired. The connecting nipple is made of ¼-inch pipe and 4 inches long, unless otherwise ordered. The hangers can be furnished in polished brass or nickel plated for fine plumbing or galvanized for ordinary work. They are made for all sizes of iron pipe, from ½-inch to 2-inch, and can be furnished without the connecting nipples when desired. A six-page folder, showing their complete line of plain and fancy hangers, can be secured on application.

The Sanos Back Water and Sewer Gas Traps.

The special feature claimed for the Sanos sewer gas and back water traps, shown in the accompanying illustrations, is that they afford a positive acting non-siphoning



The Sanos Back Water and Sewer Gas Traps.—Fig 1.—*The Sanos Basin and Sink Trap.*

automatic valve trap that cannot be deranged by clogging or the action of temperature or acids, while the construction renders every part accessible without the use of special tools. These traps are manufactured by the National Sanitary Supply Company, 147 Centre street, New York City. Fig. 1 represents a basin and sink trap in which it will be noticed at the right there is an outlet, and immediately above it is an opening for connecting the vent pipe.

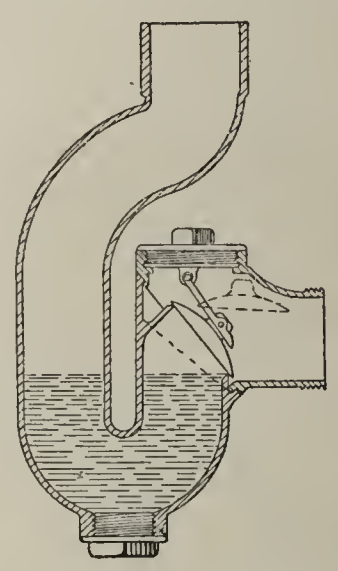


Fig. 2.—*The Sanos Urinal Trap.*

To the left of the vent connection is a hand hole opening closed by a brass screw. On removing this brass screw the valve of the trap may be lifted out. This valve is arranged so that when the fixture is discharged it raises and allows the contents of the fixture to pass unimpeded to the drain pipe. The weight of the valve is sufficient to prevent its being raised and the seal of the trap being broken by siphonic action. In case of the line of waste

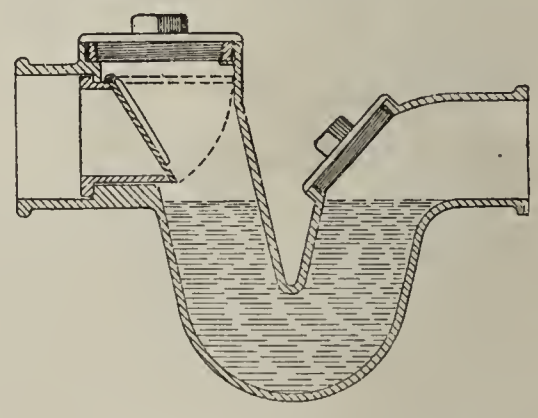


Fig. 3.—*The Sanos Running Trap.*

pipe being clogged it is impossible to flood the fixture through the trap, as the valve becomes a positive stoppage against back pressure either from fluids or from gas. Fig. 2 is a urinal trap designed to meet the regulations of cities where the urinal trap must be exposed and not hidden behind the slabs of the stalls, as has been the custom in many instances. The entire trap is entirely beneath the urinal on the outside of the slab, the outlet being arranged to pass through the slab and connect with the vent and drain pipe. It will be seen from the cut that the valve is

so arranged as to prevent flooding the fixture or breaking the trap seal from back pressure. Fig. 3 is a combination back water valve and running trap, designed to meet the New York City regulations, trap screws being placed conveniently for removing any obstacle in the trap and the valve so located as to serve as an effective barrier against flooding or gas from the sewer. Fig. 4 is a back water and sewer gas trap designed for use in connection with the ordinary running trap or in its place, the valve arrangement serving as a barrier against the entrance of sewer gas and also preventing a flooding of the building. This trap is made in all sizes from 3 to

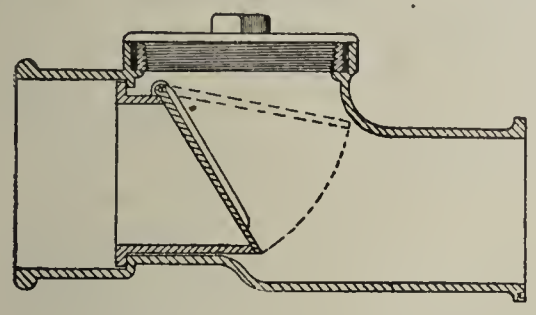


Fig 4.—The Sanos Back Water and Sewer Gas Trap.

12 inches in diameter. The running trap is made from 3 to 6 inches. The basin traps are made 1½ inches in diameter in plain brass or polished and nickel plated. The urinal traps are made from 1½ to 2 inches in size in various styles of finish. The company publish a catalogue of these goods, giving full descriptions and price-lists, and also giving letters from Charles F. Wingate and George W. Hunt, prominent sanitary engineers, who have expressed themselves favorably in reference to the construction and efficiency of the trap.

The Lee Exhaust Head.

The noiseless centrifugal exhaust head manufactured by Thomas Lee, 209 Race street, Cincinnati, Ohio, contains no baffle plates, and is so designed that there is no



The Lee Exhaust Head.

back pressure. Upon reference to the engraving it will be noted that there is a large condensing surface, the condensation being effected by centrifugal motion and expansion combined.

White Mfg. Company, 158 Indiana street, Chicago, have issued an advance sheet of Hot Blast Gasoline and Kerosene Appliances for brazing, enameling, soldering, electrical wiring, melting metals, &c., comprising the Mammoth Brazer, the Combination Brazer and Forge, the Electric Railway Bond Brazer, the Imperial Torch, the Electric Torch, the Combination Soldering Iron Heater, the Kerosene Tinners' Furnace, the Perfection Tinners' Furnace, the Silent Friend Combination Furnace, the Baby Mammoth Brazer, Hand Brazers, Torches, Enameling Ovens, &c.

Blessed be Ignorance.

How frequently we are surprised to find the conductors of great newspapers totally ignorant of what is happening under their very noses. Here, for instance, is the Chicago *Tribune* extolling in a leading editorial the formation of a master plumbers' league in the Southern States, "organized for the prevention of disease by sanitary plumbing," &c., and after elaborating on its benefits asks, "But why should the beneficence of such a league be confined to the South? Is it not needed also in the North?" If the sapient editor inquires among his Chicago neighbors he will find that one of the very first organizations of the kind in this country was long since established by the master plumbers of his own city and that no stancher league exists than the Tri State League of Illinois, Iowa and Wisconsin. The organization has done a great deal of hard work, but somebody on the *Tribune* doesn't know it.

NOTES.

The Walcott-Webster Mfg. Company are moving their downtown salesroom into more roomy quarters, at 55 Dearborn street, Chicago, and are fitting up a most elaborate display of samples of high grade Plumbing Goods.

The next annual convention of the New York State Association of Master Plumbers will be held in Binghamton, N. Y., March 1, 2 and 3. It is expected that between 250 and 300 visitors will be present, including T. P. Culloton, president of the National Association of Master Plumbers. The convention was the principal subject of discussion at a meeting of the Binghamton local association, held December 23 at the Lewis House. The meeting was held principally to listen to a number of suggestions offered by W. S. Reed of Rochester, president of the Master Plumbers' Association of this State, as to arranging for and managing a convention of this kind. Committees will be selected at a meeting to be held January 3. The convention hall and headquarters will then be decided on and other arrangements completed.

Hugh McPartland has purchased an interest in the Plumbing, Steam Fitting and Furnace business of C. C. Kunzleman, 128 Bank street, New London, Conn.

C. Probert has purchased an interest in the Plumbing business of W. J. Price, at Fargo, N. Dak., and the new firm will be known as Probert Plumbing Company.

The difficulties of reaching the Klondike may be readily understood by those who have received in their mail the Yukon Puzzle sent out by the Standard Steam Specialty Company, 83 Centre street, New York. All will not wait to solve the problem before accepting the invitation to write for their complete list of specialties and prices.

Crawford Arnold, a retired manufacturer of Gas Fixtures, &c., died suddenly at his home in Philadelphia, on December 25, aged 68 years. He was born in Providence, R. I., and going to Philadelphia on the completion of his education began his business career with the firm of Cornelius & Sons. Eventually he became a member of the firm, when they were known as Baker, Arnold & Co. Mr. Arnold retired from business several years ago.

The Bay State Metal Works, Cambridgeport, Mass., have added to their line during the year Steel Clad Baths, Enameled Steel and Solid Copper Bathtubs which have found favor with the trade in their section.

Fleck Brothers, Philadelphia, Pa., inform us that during the year they have added to their business the manufacture of Lead Pipe and have increased their facilities for handling Soil Pipe and Terra Cotta Pipe.

The Allegheny Heating Company, Pittsburgh, Pa., on December 21 declared the regular quarterly dividend of 3 per cent. and an extra dividend of 5 per cent.

Bids will be received until January 15 for plumbing and draining the Biological and Dairy Building at the New York Agricultural Experiment Station at Geneva, N. Y.

At a special meeting of the Master Plumbers' Association of Washington, D. C., held Tuesday night, December 21, the largest attendance on record was present. An election of officers was held, which resulted in the unanimous choice of William Koch as president; H. J. Allen, vice-president; E. J. Hanna, secretary; Charles Barrick, sergeant-at-arms, and Daniel Hannan was re-elected treasurer. It was decided to accept District Commissioner Black's suggestion to the association not to withdraw its representative on the Plumbers' Examining Board at the present time, and also to submit the views

of the association upon what the composition of the examining board should be.

Martin & Vezina, Montreal, Canada, plumbers, have dissolved.

M. L. Davidson, tinsmith and plumber, has moved his shop to Anaheim, Cal., where he intends to locate.

W. G. Allen has opened a plumbing establishment at Main and Cato streets, Woonsocket, R. I.

An amendment to the present ordinance for boiler inspection was passed on recommendation of the Judiciary Committee of the Chicago Board of Aldermen. The new measure makes the fees for inspection $5 and $3 per boiler, instead of $3 and $2, which was the rate established a year or two ago. The higher rate had been collected for years past. The new ordinance also has a penalty provided for non-compliance with its terms, and includes the inspection of low pressure boilers in apartment buildings.

Owing to L. H. Buddemer of Portland, Ore., retiring from the plumbing business, President Thomas P. Culloton of the National Association of Master Plumbers has appointed H. Claussenius, 422 Washington street, Portland, Ore., as State vice-president for Oregon.

The Ronalds & Johnson Plumbing Company, Hainesville, N. J., have been incorporated. The articles state the capital to be $800,000, paid in full. The office will be in Hainesville, N. J. The object of the company is to manufacture Plumbers' Supplies. The principal stockholders are P. Lorillard Ronalds, Jr., of New York and John D. Johnson of Mount Holly, N. J.

The regular meeting of the Master Plumbers' Association of London, Canada, was held in the association room, Robinson Hall Chambers, on Thursday evening, December 16, with all the members in attendance. The following officers were elected: Thomas L. Partridge, president; Ed. Holland, vice president; W. Skelly, Jr., second vice-president; James R. Haslett, secretary; Wm. Smith, treasurer.

The L. H. Prentice Company, Chicago, Ill., send out an illustrated price-list of Prentice Extension Floor Thimbles, Exhaust Pipe Heads and Register Shields. These goods, which will be of interest to the trade, are illustrated and briefly described.

Pipe Threading and Cutting Tools are illustrated and described in a catalogue issued by the Merrill Mfg. Company, Toledo, Ohio. Fine engravings show very clearly the special features of these machines, and in some cases detail engravings of broken views are presented. In all cases a thorough description is given, so that the reader can understand exactly the merits and special features of the machines. Prices and tables of sizes are likewise presented.

Henry H. Guernsey, 6 Church street, New Haven, Conn., has added to the line of celebrated Royal Hot Air Furnaces, which have proved so popular in New Haven, a complete line of Royal Hot Water and Steam Boilers, and is now prepared to do all kinds of heating.

W. A. T. Smith, New Haven, Conn., is installing one of the Kelsey Furnaces in Frederick G. Cooper's new residence and two for D. T. Ryan. Mr. Smith is also putting one of the same Furnaces in the Y. M. C. A. Building. By means of the hot water attachment hot water is supplied for the baths in the gymnasium.

Making Illuminating Gas.

In the manufacture of illuminating gas various processes are necessary, and the following is an account of the methods followed in Grand Rapids, Mich., as described in one of the local papers :

There are three systems for the production of illuminating gas in general use. The products are coal gas, water gas and that made directly from oil. Two of these, coal gas and water gas, are made in this city, and the admixture of the two produces the gas that is furnished to the consumer at the present time. In former days, before the advent of the electric light, the residents of Grand Rapids were greatly pleased to be able to have coal gas alone, but with the introduction of the new light came the effort to furnish something better than the coal gas, and the water gas system was introduced, and to-day the city is being supplied with what is admitted to be the best gas for general purposes. Coal gas is generated by the heating of soft coal to an intense heat, usually about 2500 degrees, in retorts of clay, which are heated to a white heat. After these are heated the coal is heaved into them and they are hermetically sealed to exclude the air. The coal cannot burn up, as there is no oxygen, but the intense heat drives out the gas, the process lasting four hours. The furnaces for these retorts are immense ones and each contains three retorts, one above the other. The heaving of coal into these must be done quickly and the work is by no means a pleasant task. But it is interesting to the visitor to the works to observe the perfection with which this is done. The men, two working together, do not stop to see where they are throwing the coal, but they throw it into the retorts and none of the chunks miss the opening. After the coal has been heated for the required time it is drawn out of the long horizontal retort and drops to the floor in white heat. It is then gas coke, and is used in creating the fire under the retorts, as it is regarded as the greatest heat producer. The excess of the coke over that used in the works is the commercial coke consumed about the city after it has been screened and placed in the coke house.

The retort was said to be hermetically sealed, but it is not strictly so, there being an ascension pipe through which this crude product goes into the hydraulic main, in which considerable tar, ammonia and other impurities held in suspension are separated by gravity. The gas passes on to the exhauster in another building. This is a complicated pump used to reduce the back pressure that would otherwise remain upon the retort by reason of the distillation of the gas and force it through the remaining apparatus and into the holder. The gas is then forced through the tar extractor, another piece of complex machinery. At the entrance of this the gas is highly charged with tar, and the product emitted from a stop cock will badly smear a piece of paper held at the exit. When a stop cock is opened at the opposite side of this machine a strong scent of ammonia is detected, and after the tar has been carried away to proper receptacles to be put to use the process consists in the removal of this ammonia and some other impurities, the most prominent among them being sulphur.

The ammonia is not wasted, but goes through a perfecting process and becomes commercial ammonia. From there the product passes to the condensing and cooling apparatus, which consists of four upright steel cylinders 4 feet in diameter and 30 feet high. Next are the scrubbers, which are two like cylinders and extract the ammonia. The condensation is necessary for the extraction of the ammonia and the sulphur. Now the product passes to the purifiers, the province of which is to extract the sulphur. These are rectangular iron boxes of varying sizes, those used for the coal gas being 16 feet square and about 4 feet high. Inside of these are three shelves, on which is placed the material through which the gas must trickle to take out the sulphur. The gas is admitted at the bottom and passes slowly up through the composition. This material is made of iron turnings, which are prepared by being mixed with wood shavings and sawdust. Salt water is thrown upon these and causes the iron to rust, making iron oxide, which decomposes to form a compound of iron and sulphur. The material is taken out periodically and evaporation works another change, fitting it for use again, but it finally has to be discarded. From there the finished product, condensed, cleaned and ready for use, is taken to the station meters, which are immense ones, being 8 feet in hight. These are absolutely accurate down to the fraction of a cubic foot, and it is known every night just how much gas has been produced during the day. Now it goes to the holder.

If it is a dark day or a light day the company have the measurement of the gas actually sold each day and each hour by observing the registration of the meters, so that at the end of the month, before the consumers' meters are read, it is known about how much gas has been sold, and after reading the consumers' meters it can be determined exactly what has been the leakage and condensation, which is, as a rule, from 5 to 15 per cent. The weight of the holder gives the pressure and maintains it sufficiently great to force the gas out into the street mains. After it leaves the holder it goes through the station governor, between the holder and the street mains. This is adjusted to automatically give as nearly as possible a uniform pressure throughout the city, this pressure being maintained at as low a point as possible, as excessive pressure would materially increase the unaccounted for gas by reason of the small leaks throughout the main system.

The water gas generators are large upright cylindrical vessels. Carbon, either anthracite coal or coke, is put into these from the top, upon suitable grates, and ignited. By means of an air blast, created by delicate and complex machinery placed in an apartment by itself, this is blown to a high state of incandescence. The air is then shut off and live steam is turned on under the grates. The steam passing through the incandescent carbon is disassociated, forming fixed hydrogen and carbonic acid gas. This is then carried on into another chamber filled with bricks and known as the carburetor, into which is injected naphtha, which, passing down through the heated brick, is converted into hydrocarbon, which gives the gas its illuminating power. Thence all the gas passes through the superheater, another cylinder filled with bricks, in which it is finally fixed. It now passes through condensers, washers, purifiers and into the station meters, practically the same as the coal gas, and at the outlet of the station meters the two gases are mixed in equal quantities.

SHEET METAL WORK.

Sheet Metals.

A review of the sheet metal trade of 1897 shows a marked improvement in the volume of business as compared with the previous year. As 1896, however, proved a thoroughly disappointing season to the manufacturers and jobbers, there was plenty of room for improvement without the occurrence of anything like a rushing trade. The gain, nevertheless, was sufficiently large to mark the year as one of comparative activity among the sheet iron and steel mills, which ran more steadily than for some time past. From reports we have received from manufacturers in various parts of the country it appears that during the first half of 1897 the volume of orders was merely moderate, although some heavy contracts were placed with a few favored mills in the spring, which carried them over comfortably into the second half of the year. A number of the older and less effective mills, however, remained idle or only ran intermittently. Prices, meanwhile, remained on a low and generally unprofitable level. During July most of the sheet mills were closed down pending the settlement of the wage scale, but toward the end of that month they resumed full work with a large volume of orders, which had accumulated during their idleness. Several hitherto inactive mills also started into operation at the same time. Meanwhile, there was a slight stiffening in prices, which, however, was soon checked by the material increase in the output.

During the late summer a number of the sheet mills were much hampered in their operations by the coal strike, which also affected the steel works, and caused much inconvenience from delay in the delivery of steel to the rolling mills. This condition extended over about two months and caused a temporary shut down of some of the mills. Others ran irregularly and all went behind in the fulfillment of their contracts. Dealers and consumers found it exceedingly difficult to get spot orders filled and prices again stiffened. Early in October, the sheet iron makers met at Pittsburgh and agreed upon a general advance in the price of black sheets, which was maintained with fair regularity up to the close of the year. The last quarter of the year was marked by a very decided improvement in the volume of business placed with the mills. A large number of heavy orders were entered for deliveries extending well into the first half of 1898. Moreover, the makers were able to get more profitable prices for their product. At the close of the year all the mills were busy and the makers were looking forward hopefully to an active business and better prices in the new year. The demand for light sheets in the past year was found to be relatively greater than for the heavier gauges, reaching at times very large proportions. A few of the tin plate makers took advantage of this to temporarily divert their mills from the manufacture of black plate to that of light sheet iron. This policy was not followed out to any great degree, however, although it had its effect in keeping down prices by increasing competition.

Galvanized sheets were not quite so active as black sheets, although the demand for the former reached much larger proportions last year than it did in 1896. The amount of building in which this material is used did not come up to the expectations formed for it at the outset of the year, but in other directions probably 25 per cent. more galvanized iron was used than in the previous year. During the last two months, in particular, orders were very freely placed. Several attempts have been made by the makers to advance the price of galvanized iron, but with little success. During the whole course of the year the price has been run along on a very low range with little fluctuation either way. The makers are hoping for improvement in this respect during the present year, as there is promise of a much larger consumption of galvanized iron in the building trades. The tendency of consumers to buy direct from the mills has become still more pronounced during the year. The jobbers are handling less and less sheet iron each month, and now carry very light stocks, only sufficient to supply the wants of their smaller customers. Manufacturers' agents take almost all the business in this line in all the larger centers.

Manufacturers' Reports.

We have received a number of letters from manufacturers of sheet metals, from which we select a few extracts bearing on the situation in these materials :

One of the largest concerns manufacturing iron and steel sheets in the West write as follows : We have never in our experience had a more urgent demand at the end of the season than we are now experiencing. This indicates that consumers of every class are urgently wanting material, and have comparatively small stocks from which to draw for their requirements. With this condition before us, and the prospect for a more active spring trade under the stimulating influence of a very general prosperous condition in agricultural circles, we look forward to 1898 as promising a better year's business, not only in volume, but in point of profit, than the iron trade has experienced for years. It is not likely, with the large reserve in the way of productive capacity that is represented by inadequate and idle mills, that prices will reach a boom point, but we do believe that material advances will be made in the selling price which will give a good profit to well equipped and modern factories. The condition in the raw material end of the business has shown radical improvement, and prices show strong advancing tendencies with a quickening demand. The situation as a whole is very satisfactory indeed to us.

From an important Western maker of sheet iron we get the following : The total volume of our business for the year 1897 will not be so greatly in excess of 1896, caused in some measure by the serious coal strike that prevailed, by which we were unable to run our works a part of the time full, and consequently we have not the figures yet at hand, but our impression is that the total tonnage of material made and sent out will not very much exceed that of 1896. In regard to the margin of profit, it is too early for us yet to state positively in regard to that, but we are under the impression that the margin of profit will be very small, but at the same time over and above that of the preceding year. In the matter of collections, they are much better than last year. In fact, our collections are extremely good, and our losses and bad debts are much less during the year 1897 than in the year 1896. We consider the prospects for the coming year in the volume of trade exceedingly good. We have already booked considerable business for the year 1898, and at better prices than have averaged during the year 1897, and we look for some advance in the prices of our finished material during the year 1898 over and above the present ruling prices in the market.

A Pennsylvania concern, manufacturing high grade

steel sheets, say : The business of this year, as compared with last, has been considerably more in volume, but, as to profit, little if any improvement, which is due to the present ruinous policy of the tin plate mills manufacturing and selling at a very low figure light sheets in competition with the sheet mills. Collections during this year have been very much improved over last year. For the year 1898 we think the prospects are extremely encouraging for a large volume of trade, but in our opinion prices, while possibly slightly advancing, will not reach a high level.

A manufacturer of galvanized sheet iron favors us with the following : We have done about 22 per cent. more business this year than last, at about the same percentage of profit. Collections have been better than last year, especially during October and November, but we can note but little improvement with those who were the slow fellows last year. The betterment of collections comes from quicker remittances from those who did not do badly last year. As to a higher level of prices, we cannot see where it is coming from. The purchasing capacity of the public is, we believe, but slightly improved. The burden of debt has been lifted some, but those to whom the money was due and paid are those who were able and have bought what they needed even through the hard times. The large mass of people, the agricultural classes, have had a better year of course, but they have been so badly off that their sentiment still is to wear their old clothes and use their old stove, but get out of debt first. If it will be our luck in this country to have lots of wheat to supply those who have little for a year or two longer, times might be good again.

Iron and Steel Roofing.

Sheet metal work is too broad a term and includes too many separate and distinct trades to serve as a proper subject for review. Instead of attempting therefore to make a general survey of sheet metal work we will merely touch briefly on some of the more important departments and give quotations from correspondents in roofing and cornice work, by which we mean to include makers of ceiling and sidings, conductor pipes, eave troughs, &c. The record for the year corresponds closely with the general average of all the trades. That is, as we pointed out in the brief summary on our editorial page this week, the year was to most people divided into two parts. A beginning hopeful but poor in business with a gradual awakening of trade toward the middle of the year and then considerable activity through the summer with a falling off in most cases in December. So it has been with the cornice and roofing trade. Prices also have reflected conditions prevailing in other industries, for the complaint is almost universal that the market values have ruled low, and there does not seem to be any very strong hope of an early advance.

A typical opinion is presented in the following brief extract from a letter of a correspondent who is prominent as a maker of metal roofing : Our business, especially the last part of this year, has been very much better than it was last year. Our increase has probably been 25 per cent. over last year. Prices have ruled low during the entire season, but there has been a slight improvement as compared with a year ago.

Another manufacturer in the Middle West writes : Business has been done on a smaller margin than ever before and collections have been about the same as before. We do not believe that there will be any excessive volume of business for 1898, nor will prices reach a higher level than the highest point of this year. We rather look for a scaling down in wages and materials.

We quote as follows from a letter received from a prominent Tennessee manufacturer, which shows the condition of affairs in the South : During the first half of the year business in general was very unsatisfactory and margins were very narrow. There was a perceptible improvement after July, which gradually increased until October, when it was seriously checked by the prevalence of yellow fever in different sections of the South. Business was entirely cut off in several of the centers, and directly and indirectly it affected trade all over the South, and there was no improvement until December. Since the quarantines were raised business has improved materially, but not to the extent it would have done if the price of cotton had not been so low. There seems to be only one thing in the way of a very satisfactory business during 1898, and that is the low price of cotton. We cannot tell at this time what effect this will have, but at the present time it is cutting quite a figure.

Gedge Brothers Iron Roofing Company, Anderson, Ind., take a cheerful view of the past and of the future, as indicated from the following extracts from a letter recently received : The volume of our business for this year has been much in excess of our expectations and has been greater than last year, and a very pleasing feature of it is that it is holding up much longer than usual, as ordinarily December is a very dull month, but it looks now as if it would rank as one of our very busy months. The first part of the year we did not do very much business, but in the latter part we more than made up for it, and in fact could have done still more had we not been hampered and delayed in getting steel fast enough for our wants, due to the fact that all the mills have been overcrowded with orders. This has lost us a considerable amount of trade, and of course reduces our year's business correspondingly. Prices have been very low and margins not altogether satisfactory. Yet we have done so much better than we expected at the beginning of the year that we feel we really have no cause for complaint. We think every indication is for a good business the coming year with more satisfactory margins, and we are so satisfied that business will be good that we are making our preparation accordingly.

The E. E. Souther Iron Company of St. Louis, Mo., write as follows : Business for the year has shown increasing sales both in amount and in commercial value, though the price per pound was lower than the average for 30 years ; nevertheless it is higher than for 1896, this feature being especially marked in the latter six months, though the average value of stock in store at the close of 1897 is scarcely higher than a year ago. Collections on the whole have been more prompt and satisfactory. The general aspect is more cheerful than a year ago, though we look for lower prices to prevail during the period of bad weather, say until March, owing to the scarcity of immediate demand on factories during that time. Business then, we think, will become more active due to the coming of weather for outdoor work, and all buyers and consumers will be very busy, though, as usual, a large half will be too late in putting in orders to secure timely deliveries. For the year 1898 we look for a better business than for many years before, without any mushroom boom or soda water effervescence in it.

EAVE TROUGHS, CONDUCTOR PIPES, ETC.

The following letter is from a prominent manufacturer in the East : We have found business in our line about the same as last year. We have secured a larger proportion of the business, however, so that we have had more work to do, but have reason to believe that we have merely regained customers lost in 1896, and that our increase does not come from any increase in general business in our line. The margin of profit has almost entirely disappeared in the several lines in which we deal. We should expect that the coming year would bring a large volume of business, for it seems impossible that the tremendous and profitable foreign business in breadstuffs which this country has done should continue to manifest itself in the liquidation of debts merely. We believe that it must shortly lead to commercial and industrial progress and an increase in the volume of general trade.

A maker in the Central West writes us as follows : The volume of our business has been very much greater than last year, but we judge not because of a greatly increased consumption of goods. It is rather due to this : Prices have thus far been so unsatisfactory that many makers withdraw from the market, so that what goods were made were made by a less number of manufacturers than before, consequently swelling their production. Profit on our goods through overproduction has been brought down to nothing, and the future does not hold out any very great encouragement, though we do look for a larger volume of business.

A Western manufacturer writes as follows : Our business has been unexpectedly good, especially this fall. We disposed of nearly three times as many goods in the last six months as we did in the last half of 1896. Collections are considerably better and there were but very few failures on the part of our customers. On account of the wheat crop and good prices of wheat we expect to very nearly double our business the coming season.

The Wilmington Cornice Works, Wilmington, Del., write : We have found business this year a great deal better than in 1896, and our margin of profit has been better also. Our collections have been much quicker and, in fact, 1897 has been a great improvement over any of the preceding four years, and we feel sure that the coming year will surpass this and prices are bound to reach a higher level.

The following interesting letter is received from the Moncrief-Dowman Company, Atlanta, Ga.: We found business this year to be about the same as it was in 1896, possibly a few thousands of dollars larger in volume. Of

course the margin of profit has not been quite so large on some goods, for as time progresses competition increases and where there is much competition the profits are less. However, up to the present time we are well pleased with the year's trade. Of course we cannot tell much about the prices that will prevail during the coming year, but we hope that they will increase all along the line in our classes of material, especially in the metal line. The outlook at this time for business is very promising, especially in this section of the country. In our city there has been more building than in any previous years, leaving out the exposition buildings, which were erected during 1895, and we look for many improvements in our territory, which embraces three or four of the Southern States. We have found our collections this year to be fairly good, and while we expect an increase in business for another year we do not anticipate any material advance in prices.

A prominent roofing and cornice concern in Minneapolis write: We have found business during the year slightly increased in volume over the preceding year, but the margin of profit has been sensibly decreased, owing to local conditions rather than general close figuring. We consider the prospects for the coming year to be very much better than for some years past, and believe work in our line is gradually on an increase on the better class of buildings.

We have the following letter from the J. A. Ritzler Cornice & Ornament Company, Kansas City, Mo.: We have done about double the amount of business this year as compared with last. The margin of profit, however, has been quite as small, if not smaller, than a year ago, and there is no opportunity yet for an advance. The prospects for the coming year are bright and we believe it will be a great season, providing the crops do not fail. This is particularly necessary to prosperity in this section of the country.

FLASHINGS.

We have received from the Allen Anti-Rust Mfg. Company, Cincinnati, Ohio, a circular entitled "Does Your Roof Leak?" and dwelling on their method of prolonging the life of an old roof at small expense. The circular is in the form of a folder, containing 20 pages, showing some large buildings in which Allen Anti-Rust Japan has been used for coating roofs and other exposed portions of the building with satisfaction to all concerned.

The Wais & Roos Punch & Shear Company, Cincinnati, Ohio, are now sole manufacturers of the Heckney Pneumatic Power Hammer, formerly built at Cleveland.

Among some large contracts recently taken by Moncrief-Dowman Company, Atlanta, Ga., are the Metal Work for several large schools, and also the large railway shop of the Western Railroad of Alabama at Montgomery.

The Wilmington Cornice Works, Wilmington, Del., last spring moved into new quarters at Eleventh and West streets, which gave them over 2000 feet more floor space. They find, however, that this is not sufficient for their growing business, and intend to add about 2400 more feet this winter.

The Wheeling Corrugating Company, T. H. Jones, manager, have removed their Western salesroom from Laflin street to a fine location at 185 and 187 Lake street, Chicago. They have secured a large room, 40 x 100 feet, on the ground floor, with a good basement below it, and will carry a stock of Sheet Steel Ceiling, Roofing Material, Galvanized Iron, Tin Plate and Tinners' Supplies generally. The new quarters are in the immediate vicinity of other houses handling similar materials and dealing with the same trade.

The catalogue of Peden & Co., dealers in Tinners' Supplies, Roofing Materials, &c., Houston, Texas, is a pamphlet measuring 9½ x 12 inches in size, containing 64 pages and illustrating and pricing a great variety of goods, including Sheet and Pig Metals, Eave Troughs, Conductor Pipes, Stove Pipe, Thimbles, Collars, Tinners' Trimmings, Roofing, Corrugated Iron, Metal Shingles, Weather Boarding, Steel Ceilings, Paints, &c. The latter part is taken up with Nails, Wire, Tinners' Tools and Machines, Crestings, &c.

We are indebted to the Clayton & Lambert Mfg. Company, Ypsilanti, Mich., for a copy of their catalogue devoted to Gasoline Fires and Hose Fittings. Gasoline Furnaces for tinners and plumbers are shown in several sizes; likewise Brazing Fires, Painters' Torches, Electricians' Fire Pots, &c., the latter part of the catalogue being given up to Hose Fittings, which are thoroughly illustrated and described. A smaller circular, printed in different colored inks, emphasizes the merits of the Fire Pots in a way to attract attention.

A catalogue of the La Crosse Steel Roofing & Corrugating Company, La Crosse, Wis., is a volume of 80 pages, bound in colored paper, containing many illustrations, with descriptions of the extensive line of Roofing Supplies made by this concern. The subjects noted in the catalogue include Eave Troughs, Gutters, Hangers, Troughs, Elbows, Conductor Hooks, Leader Pipes, Ventilators, Cresting Blocks, Ridgings, Window Caps, Moldings, Cornices, Weather Vanes, Steel Siding and Ceilings, Iron Shutters, &c. Other goods carried in stock include Tin Plates, Sheet Metals, Paints, Tinners' Tools, &c.

Catalogues A, B and C, issued by the Thompson Mfg. Company, Cleveland, Ohio, present very fully the extensive assortment of goods made and carried by this firm. Catalogue A, a volume 8 x 5½ inches in size, contains nearly 100 pages, and is devoted to Corrugated Sheets, Steel Roofing, Siding, &c. Catalogue B is of somewhat larger size, and refers to Galvanized Cornices, Skylights, &c., while Catalogue C, a pamphlet 11½ x 8½ inches in size, contains 40 pages, and is issued in the interest of Metal Ceilings, Side Walls, &c. The latter is given up principally to fine illustrations showing the designs in which these metal goods are made. In all cases the engravings are accompanied by brief descriptive text and price-lists.

We quote as follows from a letter from John A. Walker, vice president of the Joseph Dixon Crucible Company, Jersey City, N. J., reviewing the business situation: "In 1893 it was a case of business paralysis, in 1894 we had a year of debility, in 1895 the patient partially revived, in 1896 came a relapse, but in 1897 came recovery and the patient took up his bed and walked. The great medicine man was $1 wheat and 30-cent corn, plus poor harvests at this exigency abroad. I saw it myself, for in November I visited Indianapolis, Cincinnati, Chicago, Omaha, Denver, Kansas City, Pueblo and St. Louis, and saw every one up to his eyes in new business. The consumer at last had money once more, and was spending it."

The Russian American Trading Company, who have just been chartered under the laws of the State of West Virginia, with a capital stock of $5,000,000, propose to open stores and warehouses in St. Petersburgh, Moscow, Warsaw, Odessa, Samarkand, Omsk and Vladivostock, and to establish agencies throughout European and Asiatic Russia for the purpose of handling all classes of American manufactured products. Their efforts will, however, be chiefly devoted to the line of machinery. It is stated that they will have a competent staff of engineers in every branch, in order to enable them to take contracts for the construction of electric car lines, power and light plants, cold storage warehouses, ice factories, &c. They also propose to operate steamship lines between New York and Baltic seaports, as well as between the Pacific coast and Siberia. Among the projects of the new company is one to hold a large exposition of American manufactures and products in Moscow during 1899. The head office of the company in this country is in the Corn Exchange Bank Building, New York City.

It is reported that Japanese engineers are preparing plans for the construction of a bridge across the Straits of Shimonoseki, so as to unite the main line of the Kin Sun Railway with that of the Sanyo Railway from Shimonoseki to Hiogo. The straits, at the point referred to, are about one mile in width, and the current through them is very rapid. The bridge, moreover, must be constructed sufficiently high to enable the largest ocean steamers to pass beneath. Thus, the undertaking, if successfully carried out, would be one of the greatest engineering feats of its kind. Should the work be undertaken, it is probable that its construction will throw a large amount of business in iron structural to foreign firms. The work of construction, however, will be undertaken and supervised by Japanese engineers exclusively.

Advices from San Francisco, Cal., state that there is a famine of cargo vessels at that port for the Australian trade. Last week there were no less than three full cargoes awaiting shipment at San Francisco to Sydney, Melbourne and Adelaide, and no ship could be procured to take them over. A number of vessel owners, who have unappropriated ships, are preferring to hold them for the heavy Klondike trade expected in the early spring.

A charter has been applied for by the Kansas City, Lawrence & Topeka Electrical Railway and Power Company, with a capital of $3,000,000. It is the intention of the promoters of the enterprise to construct an electric line between Kansas City, Mo., and Topeka, Kan., to do a freight and passenger business. They contemplate using water power from two dams, one at Lawrence and one near Holliday, to generate the electricity.

The mine owners of the Ishpeming, Mich., region have decided to increase the miners' wages 10 per cent.

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TIN PLATES.

Tin Plates in 1897.

A year ago, in our review of the tin plate trade of the United States for 1896, the remark was made that the year had witnessed a complete revolution in the trade, in that the American manufacturers of tin plate had virtually monopolized the home market, with the exception of the Pacific Coast and that proportion of the consumption represented by the exporting oil and canned goods interests. During the year just closed another important step forward has been taken, and one part of the reservation then made may now be omitted. For the Pacific Coast trade, too, has dropped into the hands of the domestic tin plate makers. Only the consumption represented by the packers of goods for export remains, by virtue of the rebate allowance of 99 per cent., for the present out of reach of the American manufacturers.

So complete has been the conquest of the domestic market that to-day American plates are selling on the Atlantic seaboard 75 to 80 cents a box below the price at which Welsh plates of corresponding grades can be laid down, while the importations of foreign tin plate are confined almost exclusively to material brought in to be made up into packages and re-exported. All sizes, gauges and qualities of bright and roofing plates are now being produced by the American mills, so that there is no longer any inducement for consumers to go abroad for any of the material they may require in this line. The Welsh makers have finally recognized the inevitable and have now parted with the last lingering hopes they may have harbored of the reconquest of the American market. One of the most remarkable triumphs in the commercial history of this country has thus been won by the latest of American industries. Its definite consummation was reached in the year just ended, and 1897 must therefore take a front rank in the annals of the tin plate industry.

Increased Output.

The past year was also a notable one from the fact that it was marked by the most prodigious growth in the producing capacity of the American mills as yet recorded for any year in the history of the industry. The number of new hot mills completed or begun during 1897 was no less than 100, or about 55 per cent. over the total number recorded a year ago. This is a remarkable showing in itself, and yet it does not represent the full measure of progress accomplished. The growth in the productive capacity of the industry by the building of new mills has been further supplemented by the fact that most of the mills in existence a year ago have been steadily increasing their capacity by the introduction of improved methods and by the greater skill and efficiency which have come to the workmen with time and experience, so that the rated output of a tin mill has increased materially—possibly as much as 10 or 15 per cent. This is a fact to be reckoned with in any estimate of production and consumption. It is a feature which gives the mills in this country a decided advantage over those of Wales, where the output of a tin mill per turn is limited by the action of the men's union to 36 or 40 boxes. Here an output of 50 to 60 boxes a turn is common and the proportion is steadily growing. This forms an important factor in reducing the cost of manufacture. The advantage thus secured will tell in the future when the time arrives—as it is bound to do—for the competition of American plates with the Welsh product in the markets of the world.

Condition of Business.

In a review of the American tin plate trade during the past year several interesting features present themselves. A year ago the domestic manufacturers had to report a season of sharp disappointment both in the volume of business and in the prices at which their product was sold. The canning trade had gone through a year of pronounced depression, building operations had been conducted on a very limited scale and the tinware factories had reduced their output materially. Consequently the demand for all varieties of tin and terne plate had fallen far short of expectations. The mills had been running irregularly and the business altogether had been unsatisfactory. During 1897 these conditions underwent a radical change. Although the demand in the early part of the year continued on a moderate scale, the gradual improvement which was developed in the general business of the country as the year progressed began to have its effect in more liberal orders for tin plates, particularly from the canning trade. In the spring some large orders were placed with the mills for coke plates for progressive delivery, which carried them along comfortably to the middle of the year.

The Wage Scale.

At the approach of July 1, when the annual wage scale was to be settled, it was feared that trouble would be had with the tin plate workers in coming to a settlement of the question. The mills were all closed down on July 1 and the trade were prepared for a strike involving a more or less prolonged suspension of operations. The employers, however, settled the matter with the Amalgamated Association within a few days, on the basis of an advance in wages ranging from about 8 per cent. for rolling to 12 and 15 per cent. for heating and shearing. The new scale was signed and most of the tin plate mills were running again by the second week of July. After that time the only impediment to their activity was a pronounced scarcity of steel, which arose in the fall and hampered the mills to a serious degree. This inconvenience, which extended well into the month of November, was caused primarily by a strike in the coal trade which affected the steel mills. But the complaint was also made at the time that the steel makers had been favoring their larger customers for bars and billets to the neglect of the tin plate makers. Although the latter were forced to delay deliveries on contracts, the stringency was not as seriously felt in the tin plate trade as it might have been, for the demand for spot plates fell off materially in the last months of the year. Stocks, however, remained very light, and orders for prompt shipment could not be filled except at a sharp advance over the current rates. The year closed with practically the entire tin plate manufacturing industry in full and steady operation, many of the mills having full order books for several months ahead, while available

stocks of plates alike in makers', dealers' and consumers' hands were remarkably small.

Consumption and Prices.

Looking over reports we have received from a large number of tin plate manufacturers and dealers in all parts of the country, we gather that the increase in the volume of business done in American plates in 1897 was on an average about 25 per cent. over that of the previous years. To that extent, therefore, the past year was an improvement over the two or three preceding. Unfortunately, the gain in the amount of product put into consumption was offset by the low prices which prevailed almost throughout the entire year. Notwithstanding the efforts made by the manufacturers to hold them up, backed up as they were by many of the leading jobbing houses, tin plates alone failed to share in the improvement which was developed in almost all lines of metals in the second half of the year. On this subject the views of members of the trade which we print elsewhere will be found interesting.

The consumption of tin plates during the year kept pace about evenly with the increase in production. That is, it expanded about 25 per cent. above 1896. As the imports were applied almost wholly to the manufacture of packages for export, the American production for the year would represent about the amount actually used for domestic purposes.

What the total production of the American mills in 1897 was it is not possible to ascertain to a certainty. But that it far exceeded that of 1896 is certain. The last official figures published by Special Treasury Agent Ayer, covering the fiscal year ended June 30, 1896, placed the production of tin and terne plates for that period at 307,228,621 pounds. The official figures for the last fiscal year have not been yet published. But a careful and conservative estimate, based upon good information, would indicate that the output of the American works in the year ended June 30, 1897, reached at least 425,000,000 to 440,000,000 pounds, or between 40 and 45 per cent. increase over the previous fiscal year. As the mills, as a whole, were steadily employed in the last half of the year the proportion of output was probably raised so as to bring the total for the calendar year 1897 up to at least 500,000,000 pounds.

Association of Makers.

In the spring of 1897 a movement was started for the organization of a new association of American tin plate makers to take the place of the old Tin Plate Manufacturers' Association of the United States, which for several reasons was thought to have outlived its usefulness. The movement was fostered by several of the largest tin plate concerns and represented the more modern and progressive element in the industry. Its object was declared to be to bring the various manufacturers together for the discussion of plans looking to their mutual benefit and to place the trade on a profitable basis by means of an amicable agreement whereby the severe cutting of prices that had prevailed might be mitigated. A number of meetings were held during the spring and early summer at Pittsburgh, Chicago, Cleveland and Columbus, Ohio, and a temporary organization was effected under the title of the Tin Plate Makers' Association of the United States. A schedule of base prices was drawn up and adopted in the form of a "gentlemen's agreement" without penalties being attached for their infraction. This agreement was adhered to more or less closely for a few months, but suffered the usual fate of such agreements when the summer dullness in the trade moved some of the mills who wanted orders to begin cutting their prices again.

Nevertheless, the organization of the makers survived as a basis for future concerted action, and the old association dropped out of existence. This week the tin plate makers have again met, and it is rumored that a new effort will be made to regulate the selling price of American plates, so as to bring them up to a more profitable level.

The New Tariff.

After a long discussion the new tariff act, known as the Dingley bill, was passed into law on July 24. By its provisions the duty on imported tin plate was raised from 1 2-10 cents a pound under the Wilson-Gorman law to 1½ cents a pound. An effort to cancel the drawback allowance of 99 per cent. on re-exported plates was defeated, and that clause was continued in the new bill. The changed tariff had little or no effect on the tin plate trade, as American plates, even before its passage, were already underselling the Welsh product on the coast by about 35 to 40 cents a box, while the importation of foreign plates was confined to a few specialties and the plates used by the exporting packers. Soon after the inauguration of the Dingley law it was announced that the Welsh owners of the celebrated M F brand of terne plates had decided to discontinue their manufacture abroad and to make them exclusively in this country.

Roofing Plates.

A feature of the trade last year was a marked falling off in the consumption of roofing ternes. The decline in this line is estimated at from 40 to 50 per cent., as compared with the average of former years. Various reasons are given for the same, none of which are flattering to the hope of an early expansion in the demand for these plates for roofing purposes. It is generally claimed that other materials, such as wood and metal shingles, galvanized iron, copper and slate, were used last year on the roofs of many buildings in which tin would usually have been employed. Whether this neglect of terne plates is only a passing fancy or whether it is a permanent change is not definitely understood by the trade. Its effect upon the dipping works, however, which have made a specialty of terne plates has been very marked.

American Base Box.

During the summer the American Tin Plate Company, the largest concern in the industry, sent out circulars to the manufacturers and dealers containing a proposal for a change in the method of packing and describing tin plates through the adoption on January 1, 1898, of a new standard American base box to supersede the old English system. The project drew forth many comments pro and con from the trade, and the preponderance of opinion seemed to be against any change of the kind at present. Nevertheless, the American Tin Plate Company took the bull by the horns, got up a ratio book and in December sent out circulars stating that they would themselves adopt the new system from January 1. In this action they have the support of some of the most prominent dealers and consumers, although the trade at large have not yet signified their willingness to adopt the American base box as their standard.

Progress of the American Industry.

The regular quarterly list of American tin plate works presented in this issue shows at a glance the remarkable strides that have been made by the industry during the past year. On December 31, 1897, there were 42 tin plate works with 223 finished hot mills under the control of 40 separate firms established and in operation or ready to operate, as against 39 works with 186 finished hot mills on December 31, 1896. In addition five new plants are building, with an aggregate of 46 hot mills, and six plants are between them adding 22 more hot mills to their capacity. At the end of last year only three works were adding five new hot mills to the aggregate capacity of the industry. The total effective hot mills in existence at the present time is 223, which, with 68 more in course of erection, gives a total capacity built and building of 291 mills in the American tin plate industry, a gain of exactly 100 for the year.

The greatest advance was made in the last quarter of the year, 12 mills having been completed, and the con-

struction of no less than 78 new mills having been begun. Among the latter is embraced what will be the largest tin plate plant in the world, the 30-mill works of the Shenango Tin Plate Company of New Castle, Pa. Works were also started in two other new tin plate plants—namely, those of the Neshannock Sheet & Tin Plate Company, New Castle, Pa., with four mills, and the two-mill plant of the Johnstown Tin Plate Company, Johnstown, Pa. Besides these the National Tin Plate Company's new eight-mill works, at Monessen, Pa., and the two-mill plant of Hamilton & Co., at West Newton, Pa., are making rapid progress toward completion.

CHANGES OF THE YEAR.

Comparing the lists of tin plate works given herewith with the lists printed in *The Metal Worker* a year ago it will be seen that the changes among the concerns coming under the head of "Tin Plate Mills" have been both numerous and important. Although no concerns have actually dropped out of existence, two, while remaining separate works, have been absorbed into other concerns, and one plant has passed into new hands. Six new names have been added to the list, making 43 separate concerns with 46 plants at the end of 1897, as compared with 39 firms and the same number of plants at the end of 1896.

NEW MILLS.

A large number of the tin plate works have added to their capacity during the year just closed by building more hot mills. These additions are as follows:

	Hot mills.
Ætna-Standard Iron & Steel Company, Bridgeport, Ohio...	2
American Tin Plate Company, Elwood and Montpelier, Ind.	6
Beaver Tin Plate Company, Lisbon, Ohio.....	2
Crescent Sheet & Tin Plate Company, Cincinnati, Ohio	2
Cumberland Steel & Tin Plate Company, Cumberland, Md.	1
Ellwood Tin Plate Company, Ellwood City, Pa.....	1
Falcon Tin Plate & Sheet Company, Niles, Ohio.....	2
La Belle Iron Works, Wheeling, W. Va.....	6
Laughlin Nail Company, Martin's Ferry, Ohio	1
Licking Rolling Mill Company, Covington, Ky.....	1
Marshall Brothers Company, Philadelphia, Pa	2
New Castle Steel & Tin Plate Company, New Castle, Pa....	2
Pittsburgh Tin Plate Works, New Kensington, Pa.....	3
Washington Steel & Tin Plate Mills, Washington, Pa.....	1
Total.....	32

In addition, the construction of new hot mills was begun at the following works:

	Hot mills.
Atlanta Steel & Tin Plate Company, Atlanta, Ind.....	3
Cincinnati Rolling Mill & Tin Plate Company, Cincinnati, Ohio.....	1
Laughlin Nail Company, Martin's Ferry, Ohio.....	8
Monongahela Tin Plate Company, Pittsburgh, Pa	5
Pennsylvania Tin Plate Company, New Kensington, Pa....	2
United States Iron & Tin Plate Mfg. Company, Demmler, Pa.....	3
Total.....	22

NEW PLANTS.

Two new black plate plants were completed and put in operation during 1897, namely:

	Hot mills.
Cincinnati Rolling Mill & Tin Plate Company, Cincinnati, Ohio.....	3
Zug & Co., Limited, Pittsburgh, Pa.....	2
Total.....	5

Moreover, work has been begun during the year on the erection of five new black plate plants in Pennsylvania, and the names of the companies formed to operate them have been added to our lists. They are the following:

	Hot mills.
Hamilton & Co., West Newton, Pa.....	2
Johnstown Tin Plate Company, Johnstown, Pa.....	2
National Tin Plate Company, Monessen, Pa.....	8
Neshannock Sheet & Tin Plate Company, New Castle, Pa..	4
Shenango Tin Plate Company, New Castle, Pa.....	30
Total.....	46

CHANGES IN MILLS.

The American tin plate company of Elwood, Ind., purchased the four-mill plant of the Montpelier Sheet & Tin Plate Company, Montpelier, Ind., which went into the hands of receivers, and are operating it under their own name in connection with their Elwood works.

The two-mill plant of the Stickney Iron Company, Baltimore, Md., which was built three years ago, but was never operated, has been acquired on a long lease by the Humbert Tin Plate Company of Connellsville, Pa., and is being run under their name.

The Monongahela Tin Plate Company of Pittsburgh, Pa., who made only black plate, have absorbed the dipping plant of the Duquesne Tin Plate Company in that city, and the name of the latter concern has been removed from our list.

The Baltimore Steel, Iron & Tin Plate Company's four-mill plant at Locust Point, Baltimore, Md., which went into receivers' hands, was purchased by a newly organized company, who have improved it and are operating the works under the title of the Baltimore Tin Plate Company.

The Britton Rolling Mill Company, Cleveland, Ohio, have added a tinning department to their black plate plant.

The title of the Connellsville Sheet & Tin Plate Company, South Connellsville, Pa., has been changed to the Humbert Tin Plate Company.

DIPPING WORKS.

Among the dipping plants few changes have been made in our list during the year. The Duquesne Tin Plate Works, Pittsburgh, Pa., disappeared by absorption into the Monongahela Tin Plate Company, while Gummey, McFarland & Co. of Philadelphia have ceased to manufacture tin plate and have been dropped from our list. Otherwise these concerns remain much as they were a year ago. A few have added to their capacity, but the total number of tinning sets shown, 164, reveals a falling off of two as compared with 1896.

These plants, which purchase their black plate and coat and finish it for the market, have been running, as a rule, very irregularly in the past year. Some few which make special plates, such as high grade roofing ternes, the reputation of which is established and for which there is a steady demand, have been enabled to keep fairly busy. But the majority of these firms who manufacture for the market have not operated to anything like their capacity. Some have run only at intervals and others have been closed down all or most of the time. The close margin at which the ordinary qualities of tin and terne plate have been selling by the manufacturers who roll their own black plate has made the dipping business unprofitable, so far as the cheaper kind of plates are concerned. Where these dipping plants are located close to a black plate mill, whose product they use under a special arrangement with the rolling mill concern, the business may probably be carred on at a profit. But in the cases where they are situated at a distance from the source of supply of black plate, and have to pay the freight on their material, they are placed at so much of a disadvantage with the black plate works coating their own plate that it must be difficult for them to manufacture profitably, except, as we have said, special plates which have made a name for themselves and which command high prices.

The Outlook.

The accessions which are now under way will, during 1898, increase the producing capacity of the American mills to a very great extent. As the present capacity of the industry, if all actively employed, would be fully equal to the entire consumption of tin plates in a year of average prosperity, the question uppermost in the minds of the trade is what the effect of the enormous expansion which will take place this year will be. In the words of one of the largest manufacturers, it means the "survival of the fittest." In other words, the larger and better equipped works will get along and those less strong will go to the wall. However that may be, the fact remains

that the production of tin plate in this country must before long outrun the consumption, unless a very radical expansion in the consumption is developed. Of this there is no satisfactory indication. While the year just opened promises to be one of good business, and an increase in the demand for tin plate is looked for, there is no reason to suppose that its volume will reach such extraordinary proportions as would absorb anything like the 8,500,000 boxes which would about represent the capacity of 291 mills. The matter is one that is agitating the minds of the trade exceedingly, and it undoubtedly tends to keep the prices of tin plate down at the low level in which they are now moving. At the same time, it should be borne in mind that by far the larger portion of the new mills will not be completed in time to figure in the market before the second half of the year. Meanwhile, the existing mills will probably experience a good demand to keep them busy for the greater part of the year. Whether the prices at which they sell their product will be equally satisfactory is another matter and one which is not regarded with complete equanimity by either the manufacturers or the jobbers.

Tin Plate Machinery.

With the large additions which have been made to the American tin plate industry during the past year, and those now in progress, 1897 has been a year of marked prosperity for the manufacturers of tin plate machinery. Several new concerns have embarked in this line of manufacture and the business has grown to be one of considerable importance. A number of foundry and machine firms, which have been in existence for years producing other lines of work, are now devoting themselves exclusively to the production of tin plate and tinning machinery, which they find more profitable than their former business. Some notable improvements have been made in this department during the year, the tendency to adopt more efficient methods and labor saving apparatus having led to a number of inventions connected with tin plate manufacture. The outlook in this trade is regarded as very favorable for 1898, many of the concerns in the business having enough work on their books to keep them busy for several months to come, while the inquiries lately received point to the probability of a considerable number of new orders being placed in the near future.

Manufacturers' Reports.

With the view of giving our readers a comprehensive idea of the present position and future prospects of the American tin plate industry, as they present themselves to those intimately engaged in it, we give the following extracts from some of a mass of letters we have received from concerns engaged in the manufacture of tin plate in different sections:

A Pennsylvania rolling mill engaged in the manufacture of both black and tin plate for the market write: In regard to the business for the year, we have been very busy on orders for all our present facilities, but at extreme low prices, and we think the volume has been large, but not remunerative, and the American mills, with their increased output, have been able to supply the American market outside of the export trade, which, of course, is still imported. The prospects for the coming year look bright for a large business, but whether it will be remunerative is hard to tell. But if there is general prosperity it should increase the demand so as to give us a much better chance to handle the business on a profitable basis.

Another manufacturing concern in the Pittsburgh district express themselves as follows: With reference to business of the past year, we have had all we could do, but, as you are aware, prices are very low, and much lower than we anticipated a year ago. We have now gotten to a point where competition is a serious matter, and we are not sure that the bottom has yet been reached. The large additions now being made to increase the capacity of the tin plate mills in America are unquestionably the cause for the depressed condition of prices. It looks very much now as though domestic production might be greater next year than the consupmtion. We know of no business which has grown so rapidly in such a short time as the tin plate industry, and we are not at all pleased with the future outlook.

In the same district one of the smaller mills report their "business much better than last year; good prospects for 1898." They are in receipt of a large number of inquiries.

A similar tale is told in the following letter from a large mill in Pennsylvania: We have had a larger volume of business this year than in the previous year, but have found that competition has been keener than ever before and prices lower than at any time previous, irrespective of the fact that raw material may have been higher at times. We believe that there will be considerable tin plate trade during the coming year; but we also believe that the competition will be worse than ever heretofore. In regard to the additions now being made, and others which are on paper, our idea is that the tin business will be to a certain extent demoralized, and that it will mean a "survival of the fittest." Small mills or tin mills who have not got substantial backing are liable to be crushed out of existence. As regards the matter of production, this country already does or can produce about 15 per cent. more, according to the best available statistics, than the country itself consumes, and it seems this fact of over production will be still further increased with the new tin mills now building. The matter of competition and over production has consequently kept the price of tin at a figure when sold to the jobbers which scarcely more than pays the cost of production, whereas a fair price might be secured if the production was somewhat less than the consumption, as the lowest price which English plates can be imported at would leave the American manufacturer a nice margin for his goods if sold at the same price.

A large mill in Ohio furnish us with the following report: We have been fully occupied during the entire year, and it has been a very satisfactory one on the whole to us, although prices have ruled rather low and competition has been keen. We think that the tin plate trade for 1898 promises to be very good, and we will not be surprised to find it to be the banner year for tin plate consumption. In our opinion the large additions now being made to the tin plate producing capacity will not have any effect on the trade before late in 1898, if then; the effect will be to lower prices so that the business of reexport plates will be secured by the American makers. This will give work to all the new mills and more, too, so that we feel all the tin mills will be fully employed for some years to come. We think the American production will in time outrun the home consumption, but by this time we will be exporting tin plates to the markets of the world. There has been a large American production this year, and it will be much greater next year; but if business continues to improve, as present conditions indicate it will, the consumption will take up more than the American product.

An Indiana gas belt mill write as follows: The volume of our business for this year was about the same as last. We have noticed no appreciable increase, and prices grow weaker as time advances regardless of higher priced steel, labor, &c. This condition is undoubtedly due to the excessive competition on the part of home manufacturers, which is accentuated by the fact that the supply is in excess of the demand at certain seasons of the year, and the anxiety on the part of sellers at such periods results in the lowering of prices to a point where only the best managed and well regulated mill can make plates at a profit. On the completion of the mills now under course of construction the supply of tin plate will be far in excess of the demand as far as the home market is concerned, and the only salvation for American manufacturers to secure enough business to go round will be in the capturing of the export trade which is at present enjoyed by the Welsh manufacturer. The only way in which this can be accomplished will be by a reduction in the price of wages governed by the Amalgamated Association. This, we think, could be brought about amicably if the workmen would concede the necessary reduction on this part of the business alone, amounting possibly to 1,000,000 to 1,500,000 boxes. The failure on their part to do this means the breaking down sooner or later of the established price now prevailing in its entirety.

Jobbers' Opinions.

A number of jobbing houses in various sections have favored us with their views in regard to the tin plate trade. From among these reports the following interesting extracts are presented:

A Chicago house doing a large business in tin plate say: The last year's business has been rather unsatisfactory from a standpoint of the mills. As commission merchants we have handled a large volume of tin plates, and our margin of profit is only slightly reduced by the reduc-

tion in priecs, and so our business has been of very satisfactory nature. We think, however, that all of the makers of tin plate are dissatisfied with the trade as it has gone during past year and feel that some strong measures should be taken to put the business on a better footing. There is no reason why the tin plate makers should continue to make cutthroat prices, and the large buyers of tin plate all agree that uniform prices, even though they be materially advanced over those now ruling, would be much more desirable. The outlook for next year is promising as far as volume is concerned, but prices are being made that must necessarily show small profit to makers. The present indications are that heavy consumption of tin plate will take place during the coming year, because the probable vegetable and fruit pack will be considerably larger than during the past year.

A Southern firm of tin plate jobbers write as follows: Our business for 1897 has been satisfactory, and larger than that of 1896. The South, generally, has had a number of adverse conditions to contend against, notably the high water in the spring, the fever in the summer and fall, and the very low price for its staple product, cotton. Notwithstanding all of these, we have no complaints to offer, and have heard of none of a general and serious nature. We believe the prospects for 1898 are good, but as regards a higher level of prices we regret to say that we do not look for any such desirable condition, and can see nothing in the future to bring it about.

A large Western jobbing house handling tin plates write as follows: Our trade on tin plate for 1897 has been very largely in excess of 1896. Competition naturally seems to grow harder and more severe. We are somewhat loth to express any opinion as to the future of the trade, having in mind the fate which awaits most prophets, but if we may judge from the history of most too highly protected industries it is a fairly safe proposition that the domestic production is likely, sooner or later, to outrun the demand, and consequently to bring down the average price of tin plate to a lower level than has ever been known in this country.

The following report comes from a firm on the Pacific Coast: Until this last year the greater portion of the tin plate used on the Pacific Coast has been of foreign production, but at the present time the trade generally have swung around into the use of American tin plate, and it now looks as if the trade would continue to use plate from the American mills continuously in the future. The change in use from foreign to domestic plate has been brought about very largely by the action of the railroads in reducing the rate of freight on the article 33⅓ per cent.

A Baltimore house report that their tin plate business has been very much better than for the past two years, although prices have been lower than they should have been had dealers been alive to their interests.

An Eastern concern dealing largely in tin and terne plate give the following report: We are pleased to state that our sales of roofing plate have largely increased over last year's output. The selling prices both to the trade as well as to the consumer are being constantly made with closer margins for the manufacturer as well as the middleman. This is a natural result of increase of output. The producing capacity of the American mills is assuming enormous proportions. We are pleased to state, however, that the attention of the manufacturers has been recently directed more to the production of the higher grade roofing plates. In fact, if any profit is made in 1898 by the manufacturers of roofing plate, those mills making the largest percentage of special brands will undoubtedly be the only ones that will report at the close of the year a balance on the credit side. The cheapest grades have reached the minimum quality, as any injudicious economy attempted by any manufacturer in lessening the quantity or quality of coating would tend to throw trade most positively and directly toward higher grade plates. The architects in our vicinity are almost vying with each other in their specifications, and are exerting every effort to induce dealers to use high grade plates. You will undoubtedly note a general closing of the low grade roofing plate concerns, or at least frequent stoppages " for repairs " between January 1 and September 1.

A large hardware concern in the Southwest give the following report : Since the settlement of the financial question last fall business has had a much better tone and strength. An improvement commenced at once, but during the winter succeeding, the volume was only slightly increased, compared with the same season of the two preceding years. It has constantly improved during the spring, summer and fall, and our business is 25 per cent. greater than that of 1895 and 1896. Competition is very active, but prices have been fairly well maintained. We consider the prospect for sales of roofing plate very good for the coming year. That of the bright plate is not so good in this section, owing to the low prices of tinware sold by the large factories. We anticipate a prosperous business for 1898, and with the average condition of agriculture we know of no reason why, with the present general feeling of security about money matters, we should not have a successful business.

A Texas jobbing house dealing largely in tin plate state that their sales last year compared very favorably with former years, in spite of yellow fever and low prices for cotton. They expect a still better trade in 1898, especially in the line of roofing plates.

MEETING OF TIN PLATE MAKERS.

An important and well attended meeting of tin plate makers was held on Wednesday and Thursday of this week at Columbus, Ohio. Matters of considerable importance are reported to have been under discussion, but up to the time of going to press no details in regard to the results of the conference had transpired. It is understood that among the subjects considered was a request from the jobbers that the cash discount be made 2 per cent. instead of 1 per cent. as now, as well as a request of the National Hardware Association to have the time on which tin plate is bought extended from 30 to 60 days. The new American base box system was also a subject of interested discussion. The new system introduced by the American Tin Plate Company is much talked of in the trade, and opinions as to the desirability of its adoption differ widely. In Chicago one of the largest jobbing houses announce that they will adopt it at once, while the others are uncertain what they will do in the matter. Some of the New York jobbers are favorable to the plan, but most of them are inclined to wait until the trade are educated to it before adopting it themselves. In view of the low prices ruling for tin plate, especially for Cokes, it is thought probable that an effort will be made to reorganize the Tin Plate Association with the view of keeping prices on a more profitable basis.

SCRAP.

The advertisement in the present issue of the house of N. & G. Taylor Company, Philadelphia, is their eighty-ninth annual greeting to the trade. As one of the oldest houses in their line and as one of the early advertisers in *The Metal Worker* it affords us pleasure to commend to our friends this old established Tin Plate house, now closely bordering on their ninetieth year of existence. Established in Philadelphia away back in 1810, by the grandparents of the present members, when the city covered only a few square miles, this firm have grown in proportion with the growth of the city of their birth. Their agencies now extend to almost every city in the United States, and their Taylor Old Style brand of Roofing Tin is handled by leading jobbers throughout the country.

We are advised by L. L. Abbott & Co., 136 Liberty street, New York, agents for the M F Roofing Plate, that they are in receipt of a very heavy demand for their Plates. The M F plant, at the Ellwood Tin Plate Company's works, Ellwood City, Pa., is running night and day in all departments to keep pace with orders. The quality of the American made M F Ternes is declared by all those who have tried them to be fully equal to that of the same Plates when they were made in and imported from Wales. This bears out the statement of the owners that the Plates made in this country and sold under the well-known brand would be in all respects identical with those manufactured and sold by them on the other side for over 50 years past. An absolute guarantee of quality is given with each box of M F Terne.

The 1898 calendar which the well-known Tin Plate and Metal house of Bruce & Cook, New York City, are sending out this year is of the familiar pattern which has greeted their friends for many years past. It consists of a large sized card for hanging, in the center of which are given exterior views of their premises at 186-190 Water street and 248 and 250 Pearl street. On either side of the illustrations are placed tables of the months, while above and below are lists of the goods dealt in by the firm. The present calendar, which marks the eighty-sixth year of the firm, is printed in dark brown with a tasteful border in brown and yellow. A new departure has been made by the firm this year in sending out with their calendar, instead of the customary circular, a reprint of the illustrated article, " A Pioneer Metal House," which appeared in *The Metal Worker* of December 25, 1897. This will no doubt come as a pleasing and interesting souvenirs to their many friends and customers throughout the country.

Alphabetical List of Makers' Brands of American Tin and Terne Plate.

(N. B.—The numbers given below correspond to those opposite the names of makers on the supplement pages.)

January 1, 1898.

BRIGHT CHARCOAL PLATES.

Name.	*Maker.*
Ætna	1
Albright	18
Alcania	44
Althea	46
Americana	44
Anti-Rust	13
Arlington	45
Baltimore	5
Beaver	6
Belle Isle	64
Belmont	64
Brilliant	69
Britton	8
Buckeye	8
Carol	46
Century	65
Channing	45
Clifton	53
Columbia	44
Crescent	11
Crocus	14
Daisy	14
Donner	28
Dorothy	26
Ewing	71
Finest	53
Florence	58
Florida	59
Fort Henry	71
Grace	26
Granite	38
Guernsey	27
Hand Dipped	69
Hazen	3
Howard	59
H. P	60
Hyacinth	14
Imperial	3
Irondale	40
Irwin	28
Ivy	54
Jack	26
Jewel	60
Jonquil	14
Juno	7
Laughlin	22
L. & G. Mfg. Co	21
Linden	69
Matter	28
Melvin	32
Merion	69
Minerva	58
Moose	15
Morton	27
New Castle	30
New Cresta	46
Oak	65
Onyx	33
Opal	33
Palm	30
Palma	58
Pansy	7
Pansy	54
Peerless	45
P-e-e-r-l-e-s-s	3
Penn Treaty	24
Petunia	49
Pisa	58
P. O. P	13
Premier	3
Primrose	49
P. S. & Co	7
Rambler	60
Range	32
Record Charcoal	67
Regent	27
Rieka	46
Royal	69
Saturn	13
Shenango	30
Silverine	13
Somerbrook	36
Somerton	36
Spa	58
St. Louis	38
Sylvania	44
Tulip	14
U. S. Bright	39
Versailles	39
Villette	46
Violet	58
Virginia	44
Washington	41
Wheeling	71
White Rose	27
Woodward	20
Youghioghcny	39

BRIGHT COKE PLATES.

Name.	*Maker.*
Ætna	1
Alba	33
Alba Extra	33
Albert	59
Alcania	44
Almond	69
American	13
American Palm	13
Anderson	28
Apex	7
Ariel	46
Atlanta	4
Baltimore	5
Beaver	6
Bellevue	64
Belona	64
B. G	32
Britton	8
Brooklyn	59
Buckeye	8
Cambridge	27
Clover	14
Crane	18
Crescent	11
Delta	46
Elk	15
Ensign	9
Franklin	45
Furnace	53
Gladys	65
Hazen	3
Helena	44
Humbert	17
Imperial	45
Irondale	40
Kanner	3
Koko	3
Kream	3
La Belle	20
Laughlin	22
L. & G. Mfg. Co	21
Leslie	58
Locust	69
Lorna	33
L-Wood	3
Mint	69
Monon	25
National	28
New Castle Coke	29
New Castle Palm	29
Oliver (O. H.)	25
Peconic	32
Pennant	9
Penn Treaty	24
Pink	54
Record Coke	67
R. H. J	26
Rose	58
S. J. R	46
Somerton	36
Star	37
Steel Coke	38
Thayer	71
Thistle	27
Wallflower	44
Walnut	65
Washington	41

TERNE PLATES.

Name.	*Maker.*
Acme Old Method	38
Ainacla	44
Alaska	58
Albemarle	64
Alcania	44
Allegheny	53
Allegheny	56
Alta	39
Amber	33
America	66
American Old Style	58
American Standard	27
Amer. M. S	45
Apollo Terne Sheets	47
Arch	58
Arrow	45
Atlanta	4
Aurora	9
Bala	7
Baltimore	5
Banner	13
Barto	46
Beaver	6
Belmont	1
Belmont Best	1
Belmont Special	1
Black Diamond	45
Blueflower	14
Boaz	68
Bonus	54
Boston	65
Boston Old Method	65
Braddock	53
Britton	8
Buckeye	8
Camaret	58
Cambria	44
Cambridge New Method	27
Cambridge Old Style	27
C. H	66
Charter Oak	13
Cherokee	64
Chesapeake	64
Coin Old Method	9
Columba	44
Columbia	69
Columbus	65
Cornflower	14
Crane	18
Crane Extra Coated	18
Crane Old Style	18
Crescent & Star	11
Crown	7
Crown Old Method	46
Dandy	60
Dawn	9
Defender	32
Devon	7
Dover	46
Dover Extra	46
Dover Old Method	46
Drake	15
Duck	15
Duquesne	53
Echo	60
Economy	27
Eleanor	71
Elsie	58
E-l-w-o-o-d	3
Elziver	70
Eminent Old Method	46
Emlyn	58
Empire Hand Coated	58
Enid	70
Eureka	57
Excelsior	59
Extra Fine	38
Ferguson's Extra Coated	52
Ferguson's Old Style	52
Ferguson's Redipped	52
Flushing	59
Fort Pitt	54
Freeport	56
F. R. P. Extra	65
F. W. B. Old Style	26
G. A. R	54
Girard	24
Globe	69
Gold Standard	9
Grace	59
Greenbrier	64
Hamilton's Best Redipped	54
Hamilton's Excelsior Hand Coated	54
Hancock	45
Hawthorne	44
Hazlewood	54
Helen	71
Hickory	58
H. M	66
Horse Shoe	45
Horton	66
I. D. B	45
Indian	64
I-n-d-i-a-n-a	3
Iron City	25
Irondale	40
J. D. L	23
J. H. R	26
Juniata	30
Kanawha	64
Kelso	7
Kenton	53
Kensington	33
Keystone	45
Keystone Hand Dipped	45
Killbuck	54
Kismet	58
Knoxall	69
Laufman's Apollo	55
Laughlin	22
L. C	66
Leatherwood	27
L-e-e-d-s	3
L. & G. Mfg. Co	21
Lima Redipped	52
Lionel	53
Los Angeles	44
Lulu	54
Magnet	52
Mahoning	44
Manchester	25
Maple Old Method	69
Margaret	71
Marshall	24
Mayflower	44
Medal Old Style	9
Merchant's Old Method	58
Merchant's Roofing	58
Merion	7
Meurer's Old Method	59
Meurer's Roofing	59
MF	13
M. F. H	23
M. F. H. Best	23
M. F. H. Extra	23
Mingo	46
Mingo Old Process	54
ML Old Style	9
Mohawk	64
Monogram	13
Moonflower	14
Mt. Penn	66
National	65
N. C. T	13
Nelson	71
Neville Old Style	53
New Castle Old Method	30
N. F	49
N. & H. Roofing	60
Nivin & Hassard Old Method	60
Norristown New Method	61
North Star	27
Oakmont	53
Official	14
Old Reliable Redipped	53
Old Style Oil Finish	7
Optimus	49
Orbit Redipped	53
Orient	9
Orient Crown	7
Orion	7
Osceola Old Style	54
Palm	58
Pawnee	64
Pasadena	44
Pencoyd	46
Penn Treaty	24
Phillips' Roofing	65
Piqua	51
Pittsburgh	53
Plumbum	44
Potomac	64
Potts' A. L. S. Old Style	7

Potts' Old Process..... 7	Sherwood..... 53	Trotter's American New Method..... 70
Preble Extra..... 46	S L S Old Method..... 38	Trotter's Roofing..... 70
Primrosa..... 44	Soho..... 25	Trotter's Special..... 70
Protection Old Process..... 53	Special..... 57	U. S. Eagle..... 39
P. T. L..... 26	Special Extra Coated..... 58	U. S. Grant..... 39
P. T. W. Old Fashion..... 33	Spring..... 66	U. S. Monongahela..... 39
Pullman..... 59	Spruce..... 69	U. S. Redipped..... 39
Puritan..... 45	Standard Al..... 44	Verona..... 70
Quaker City..... 45	Standard..... 1	Volcano..... 52
Queen City Old Style..... 68	Standard..... 59	Washington..... 41
Raymond..... 53	Stanley..... 58	Washington Old Style..... 41
Reading Roofing..... 66	Starflower..... 14	Weather-proof..... 13
R-e-i-d..... 3	Sunflower..... 14	West Virginia..... 20
Republic..... 65	Superior..... 59	West Virginia Old Style..... 20
Rivanna..... 64	Supreme..... 44	Wildflower..... 14
Riverside..... 68	Swan..... 15	Willow..... 69
Rutter..... 7	Tandem..... 58	Wylie..... 71
Sanatoga..... 46	Taylor Old Style..... 69	York..... 64
Scott's Extra Coated..... 53	Taylor Roofing Tin..... 69	Zenith..... 7
Sensation..... 60	The J. McD. & Sons' Co. Old Style..... 57	Zero..... 65
S G..... 38	Thurso..... 53	
Sharon..... 70	Tip Top..... 56	**TAGGERS TIN.**
Sheffield..... 25	Triumph..... 70	Hazen..... 3
Shenango..... 30	Triumph Old Style..... 53	Melba..... 33

DEALERS' SPECIAL BRANDS.

BRIGHT CHARCOAL PLATES.

Name of Brand.	*Dealer's Name and Address.*
AITCH	Lyon, Conklin & Co., Baltimore, Md.
ALICE	Stratton & Terstegge, Louisville, Ky.
ALTAMONT	Lyon, Conklin & Co., Baltimore, Md.
ARCHO	Williams & Co., Columbus, Ohio.
AURORA	W. C. Hopson & Co., Grand Rapids, Mich.
AUSTEN EXTRA	Austen & Doten, Boston, Mass.
BESSIE	McClure & Co., Pittsburgh, Pa.
BLACK HAWK	E. E. Souther Iron Co., St. Louis, Mo.
BUCKEYE	W. F. Janeway, Columbus, Ohio.
BUFFALO	E. E. Souther Iron Co., St. Louis, Mo.
BURREY	E. L. Parker & Co., Baltimore, Md.
CAMBRIDGE	Cambridge Mfg. Co., Cambridge, Ohio.
CHAMPION, CLIMAX, COLONIAL	Gummey, McFarland & Co., Philadelphia.
CRYSTAL	E. L. Parker & Co., Baltimore, Md.
CUPOLA	McClure & Co., Pittsburgh, Pa.
DEKALB	Bannantine Galvanized Iron Mfg. Co., St. Louis, Mo.
DESOTO	Simmons Hardware Co., St. Louis, Mo.
DIAMOND SPECIAL	Wells & Nellegar Co, Chicago.
GLEN	W. F. Janeway, Columbus, Ohio.
GOLDEN STAR	J. M. & L. A. Osborn, Cleveland, Ohio.
HERO	Witte Hardware Co., St. Louis, Mo.
HILDA, HUBERT	W. C. Hopson & Co., Grand Rapids, Mich.
INDIA	J. L. Perkins & Co., Chicago.
J. M. & L. A. O. EX. BRIGHT	J. M. & L. A. Osborn, Cleveland, Ohio.
JUNO	Witte Hardware Co., St. Louis, Mo.
LACLEDE	Simmons Hardware Co., St. Louis, Mo.
LUCILE	W. C. Hopson & Co., Grand Rapids, Mich.
MARIE	Illinois Roofing & Supply Co., Chicago.
MARS	Gummey, McFarland & Co., Philadelphia.
MAY	J. L. Perkins & Co., Chicago.
MENTOR	J. M. & L. A. Osborn, Cleveland, Ohio.
MILDRED	Lyon, Conklin & Co., Baltimore, Md.
MOHAWK	Hibbard, Spencer, Bartlett & Co., Chicago.
MOLLIE	Illinois Roofing & Supply Co., Chicago.
MYRTLE	J. L. Perkins & Co., Chicago.
NEPTUNE	Gummey, McFarland & Co., Philadelphia.
NETTIE, OLLIE	Illinois Roofing & Supply Co., Chicago.
OSBORN	J. M. & L. A. Osborn, Cleveland, Ohio.
PARKTON	E. L. Parker & Co., Baltimore, Md.
PATRIOT	Williams & Co., Columbus, Ohio.
PENMAR	E. L. Parker & Co., Baltimore, Md.
PENROSE	C. Sidney Shepard & Co., Chicago.
PHŒNIX	Gummey McFarland & Co., Philadelphia.
QUEEN	W. C. Nimmo & Co., Baltimore, Md.
RUSSELL	W. F. Janeway, Columbus, Ohio.
RUTH	McClure & Co., Pittsburgh, Pa.
SHEPARD'S EXTRA	Sidney Shepard & Co., Buffalo, N. Y.
SILVER STAR	J. M. & L. A. Osborn, Cleveland, Ohio.
SOULARD	Bannantine Galvanized Iron Mfg. Co., St. Louis, Mo.
STAG	Gummey, McFarland & Co., Philadelphia.
STERLING	McClure & Co., Pittsburgh, Pa.
SUN	Gummey, McFarland & Co., Philadelphia.
THEBA	McClure & Co., Pittsburgh, Pa.
TONQUIN	E. S. Wheeler & Co., New Haven, Conn.
WALTER	Lyon, Conklin & Co., Baltimore, Md.
WYETH	Wyeth Hardware Co., St. Joseph, Mo.
YORK	Letcher & Norton, Jersey City, N. J.

BRIGHT COKE PLATES.

ALFRED	J. L. Perkins & Co., Chicago.
ASTOR	McClure & Co., Pittsburgh, Pa.
BEACH	E. L. Parker & Co., Baltimore, Md.
BERTHA	Stratton & Terstegge, Louisville, Ky.
BIRCH	E. L. Parker & Co., Baltimore, Md.
CACTUS	Hibbard, Spencer, Bartlett & Co., Chicago.
CAIRO	E. L. Parker & Co., Baltimore, Md.
CAMBRIDGE	Cambridge Mfg. Co., Cambridge, Ohio.
COKE	Bannantine Galvanized Iron Mfg. Co., St. Louis, Mo.
EDNA	J. L. Perkins & Co., Chicago.
ELSA	Stratton & Terstegge, Louisville, Ky.
EMERSON	W. F. Janeway, Columbus, Ohio.
EUCLID	J. M. & L. A. Osborn, Cleveland, Ohio.
FURMSTON	C. Sidney Shepard & Co., Chicago.
GLENN	Austen & Doten, Boston, Mass.
HUBERT	W. C. Hopson & Co., Grand Rapids, Mich.
JOKER	Illinois Roofing & Supply Co., Chicago.
LEE	W. C. Nimmo & Co., Baltimore, Md.
LUNAR	E. L. Parker & Co., Baltimore, Md.
MABEL	Stratton & Terstegge, Louisville, Ky.
MIDWAY	McClure & Co., Pittsburgh, Pa.
MONARCH, OAK	E. L. Parker & Co., Baltimore, Md.
OLD HUNDRED	Hibbard, Spencer, Bartlett & Co., Chicago.
OZARK	Simmons Hardware Co., St. Louis, Mo.
POLO	E. L. Parker & Co., Baltimore, Md.
RED, WHITE AND BLUE	Hibbard, Spencer, Bartlett & Co., Chicago.
WILLOW	E. L. Parker & Co., Baltimore, Md.
X RAYS	Gedge Bros. Iron Roofing Co., Anderson, Ind.

TERNE PLATES.

ABBEY	E. L. Parker & Co., Baltimore, Md.
ADMIRAL	McClure & Co., Pittsburgh, Pa.
ADVANCE	Stratton & Terstegge, Louisville, Ky.
AJAX	Witte Hardware Co., St. Louis, Mo.
A. J. T.	Stratton & Terstegge, Louisville, Ky.
ALAMO	Bruce & Cook, New York.
ALBANY	Southern Ry. Supply Co., Richmond, Va.
ALDERLY	Gummey, McFarland & Co., Philadelphia, Pa.
A. L. S. NEW METHOD	W. F. Janeway, Columbus, Ohio.
AMERICAN EAGLE	Stratton & Terstegge, Louisville, Ky.
ANCHOR	Gummey, McFarland & Co., Philadelphia, Pa.
APEX	Lyon, Conklin & Co., Baltimore, Md.
AROYA	J. L. Perkins & Co., Chicago.
ATLANTIC	Mortimer H. Cort, New York.
ATLAS	J. M. & L. A. Osborn, Cleveland, Ohio.
BALM'S NEW METHOD	Illinois Roofing & Supply Co., Chicago.
BANNANTINE'S JUNIATA, BANNANTINE'S OLD STYLE, BANNANTINE'S REFINED, BANNANTINE'S STANDARD	Bannantine Galvanized Iron Mfg. Co., St. Louis, Mo.
B. D	Horton, Gilmore, McWilliams & Co., Chicago.
BECK	W. C. Nimmo & Co., Baltimore, Md.
BERGEN OLD STYLE	Letcher & Norton, Jersey City, N. J.
BIGGS OLD METHOD	J. L. Perkins & Co., Chicago.
BISMARCK	W. C. Hopson & Co., Grand Rapids, Mich
BRIGHTEST AND BEST	Wyeth Hardware Co., St. Joseph, Mo.
BRUCE'S OLD METHOD, BRUCE'S OLD STYLE	Bruce & Cook, New York.
B. S. B. REDIPPED	Williams & Co., Columbus, Ohio.
BUFFALO	Peden & Co., Houston, Texas
BUFFALO BEST	Sidney Shepard & Co., Buffalo, N. Y.
B. & W	Brown & Wales, Boston, Mass.
CAIRO	E. L. Parker & Co., Baltimore, Md.
CALLA LILY	E. E. Souther Iron Co., St. Louis, Mo.

The Metal Worker Quarterly List of American Tin Plate Works.

TIN PLATE MILLS.

	NAME OF FIRM.	LOCATION OF WORKS.	NO. OF HOT MILLS. Completed.	NO. OF HOT MILLS. Building.	NAMES OF BRANDS. BRIGHT TIN PLATES. Charcoal.	NAMES OF BRANDS. BRIGHT TIN PLATES. Coke.	NAMES OF BRANDS. TERNE PLATES.	REMARKS.
1	ÆTNA STANDARD IRON & STEEL CO.	BRIDGEPORT, OHIO.	8	....	Ætna AA1, Ætna AA, Ætna A, Ætna.	Ætna	Belmont, Belmont Best, Belmont Special, Standard.	
2	AMERICAN SHEET IRON CO.	PHILLIPSBURG, N. J.	1					Not in operation.
3	AMERICAN TIN PLATE CO.	ELWOOD, IND. MONTPELIER, IND. Premier	10 6	....	Hazen, Imperial, P-e-e-r-l-e-s-s.	Hazen, Kanner, Koko, Kream, L-Wood	E-l-w-o-o-d, I-n-d-i-a-n-a, L-e-e-d-s, R-e-i-d.	Taggers brand, "Hazen."
4	ATLANTA STEEL & TIN PLATE CO.	ATLANTA, IND.	3	3		Atlanta	Atlanta.	
5	BALTIMORE TIN PLATE CO.	LOCUST POINT, BALTIMORE, MD	4	..	Baltimore	Baltimore	Baltimore.	
6	BEAVER TIN PLATE CO.	LISBON, OHIO	6	...	Beaver A, Beaver AA, Beaver AAA.	Beaver	Beaver, Beaver Best, Beaver Extra, Beaver Special.	
7	BLAIRSVILLE ROLLING MILL & TIN PLATE CO	BLAIRSVILLE, PA.	2	....	Juno, Pansy, P. S. & Co	Apex	Bala, Crown, Devon, Kelso, Merion, Old Style Oil Finish, Orient Crown, Orion. Potts A L S Old Style, Potts Old Process, Rutter, Zenith.	
8	BRITTON ROLLING MILL CO.	CLEVELAND, OHIO	3	....	Britton, Buckeye	Britton, Buckeye,	Britton, Buckeye.	
9	CANONSBURG IRON & STEEL CO.	CANONSBURG, PA.	4	....		Ensign, Pennant	Aurora, Coin Old Method, Dawn, Gold Standard Redipped, Medal Old Style, ML Old Style, Orient.	
10	CINCINNATI ROLLING MILL & TIN PLATE CO.	CINCINNATI, OHIO.	3	1				
11	CRESCENT SHEET & TIN PLATE CO.	CLEVELAND, OHIO.	6	....	Crescent AAA, Crescent AA, Crescent A	Crescent C	Crescent 1 Star, Crescent 2 Star, Crescent 3 Star, Crescent 4 Star.	
12	CUMBERLAND STEEL & TIN PLATE CO.	CUMBERLAND, MD.	5	....				Make black plate only.
13	ELLWOOD TIN PLATE CO.	ELLWOOD CITY, PA.	5	....	Anti-Rust, P.O.P., Saturn, Silverine.	American, American Palm	Banner, Charter Oak, M. F., Monogram, N. C. T., Weatherproof	
14	FALCON TIN PLATE & SHEET CO.	NILES, OHIO	6	....	Crocus, Daisy, Hyacinth, Jonquil, Tulip	Clover	Blueflower, Cornflower, Moonflower, Official, Starflower, Sunflower, Wildflower.	
15	GREAT WESTERN TIN PLATE CO.	JOLIET, ILL.	4	....	Moose	Elk	Drake, Duck, Swan.	
16	HAMILTON & CO.	WEST NEWTON, PA.	....	2				Plant building,
17	HUMBERT TIN PLATE CO.	SOUTH CONNELLSVILLE, PA. BALTIMORE, MD.	4 2	....		Humbert.		
18	IRONDALE STEEL & IRON CO.	MIDDLETOWN, IND.	6	....	Albright	Crane	Crane, Crane Extra Coated, Crane Old Style.	
19	JOHNSTOWN TIN PLATE CO.	JOHNSTOWN, PA.	....	2				Plant building.
20	LA BELLE IRON WORKS.	WHEELING, W. VA.	10	....	Woodward A, Woodward B	La Belle	West Virginia A, West Virginia B, West Virginia Old Style.	
21	LALANCE & GROSJEAN MFG. CO.	HARRISBURG, PA.	3	..	L. & G. Mfg. Co. AA1, L. & G. Mfg. Co. AA2, L. & G. Mfg. Co. AA3, L. & G. Mfg. Co. AA5	L. & G. Mfg. Co. AA4, L. & G. Mfg Co. AA6, L. & G Mfg. Co. AA7	L. & G. Mfg. Co. A1, L. & G. Mfg. Co. A2, L & G. Mfg. Co. A3.	
22	LAUGHLIN NAIL CO.	MARTIN'S FERRY, OHIO	6	8	Laughlin	Laughlin	Laughlin	
23	LICKING ROLLING MILL CO.	COVINGTON, KY.	2	....			J. D. L., M. F. H., M. F. H. Best, M. F. H. Extra, New South.	
24	MARSHALL BROS. & CO.	PHILADELPHIA, PA.	6	....	Penn Treaty	Penn Treaty	Girard, Marshall, Penn Treaty.	
25	MONONGAHELA TIN PLATE CO.	PITTSBURGH, PA.	9	5		Monon, Oliver (O.H.)	Iron City, Manchester, Sheffield, Soho.	
26	MOREWOOD CO., THE	GAS CITY, IND.	8	....	Dorothy, Grace, Jack	R. H. J.	F. W. B. Old Style, J. H. R., P. T. L.	
27	MORTON TIN PLATE CO.	CAMBRIDGE, OHIO.	3	..	Guernsey, Morton, Regent, White Rose	Cambridge, Thistle.	American Standard, Cambridge New Method, Cambridge Old Style, Economy, Leatherwood, North Star.	
28	NATIONAL TIN PLATE CO.	ANDERSON, IND. MONESSEN, PA.	6	 8	Donner, Irwin, Matter	Anderson, National		Monessen plant under construction.
29	NESHANNOCK SHEET & TIN PLATE CO.	NEW CASTLE, PA.	...	4				Plant building.
30	NEW CASTLE STEEL & TIN PLATE CO.	NEW CASTLE, PA.	20	..	New Castle Best Palm, New Castle Palm, New Castle Charcoal, Shenango	New Castle Palm. New Castle Coke.	Juniata, New Castle Old Method, Shenango.	
31	OHIO RIVER SHEET & TIN PLATE CO.	REMINGTON STATION, PA.	2	....				Make black plate only.
32	PENNSYLVANIA TIN PLATE CO.	NEW KENSINGTON, PA.	4	2	Melvin, Range	B. G., Peconic	Defender.	
33	PITTSBURGH TIN PLATE WORKS.	NEW KENSINGTON, PA.	6	....	Onyx, Opal	Alba, Alba Extra, Lorna	Amber, Kensington, P. T. W. Old Fashion	Taggers brand, "Melba."
34	REEVES IRON CO.	CANAL DOVER, OHIO.	3	....				Make black plate only
35	SHENANGO TIN PLATE CO.	NEW CASTLE, PA.	....	30				Plant building.
36	SOMERTON TIN PLATE WORKS.	BROOKLYN, N. Y.	3	...	Somerbrook, Somerton	Somerton. Star		Not in operation.
37	STAR TIN PLATE CO.	PITTSBURGH, PA.	8	....				

40	WALLACE, BANFIELD & CO.	IRONDALE, OHIO	4	...	Irondale A, Irondale AA, Irondale AAA, Irondale B, Irondale BC	Irondale C	U. S. Eagle, U. S. Grant, U. S. Monongahela, U. S. Redipped Irondale A, Irondale AA, Irondale AAA, Irondale B Irondale Old Style, Irondale W. B.	
41	WASHINGTON STEEL & TIN PLATE MILLS	WASHINGTON, PA	4	....	Washington	Washington	Washington, Washington Old Style.	
42	WHITAKER IRON CO	WHEELING, W. VA	3	..				
43	ZUG & CO., LTD	PITTSBURGH, PA	2					Make black plate only.
	Total Hot Mills		223	68				

DIPPING PLANTS.

	NAME OF FIRM.	LOCATION OF WORKS.	NO. OF TINNING SETS.	NAMES OF BRANDS. BRIGHT TIN PLATES. Charcoal.	BRIGHT TIN PLATES. Coke.	TERNE PLATES.	REMARKS.
44	ALCANIA TIN & TERNE PLATE CO	YOUNGSTOWN, OHIO	3	Alcania, Americana, Columbia, Sylvania, Virginia	Alcania, Helena. Wallflower.	Columba, Los Angeles, Pasadena, Primrosa, Standard A1.	
45	AMERICAN TIN & TERNE PLATE CO	PHILADELPHIA, PA	10	Arlington, Channing, Peerless	Imperial, Franklin	Ainacla, Alcania, Cambria, Hawthorne, Mahoning, Mayflower, Plumbum, Supreme.	{Lead coated plates.
46	AMERICAN TIN PLATE MACH. & MFG. CO	CANAL DOVER, OHIO	8	†Althea, Carol, New Cresta, Rieka, Villette	Ariel, Delta, S. J. R.	Amer. M. S., Arrow, Black Diamond, Hancock, Horse Shoe, I. D. B., Keystone, Keystone Hand Dipped, Puritan, Quaker City.	
47	APOLLO IRON & STEEL CO	APOLLO AND VANDEGRIFT, PA	2			Barto, Crown Old Method, Eminent Old Method, Mingo, Pencoyd. Preble Extra, Sanatoga, *Dover, *Dover Extra, *Dover Old Method. Apollo Terne Sheets.	{*Continuous roofing. †Tinned iron.
48	BUHL STAMPING CO	DETROIT, MICH	5				
49	CADWALLADER, C. W	PITTSBURGH, PA	4	Petunia, Primrose		N. F., Optimus.	Make bright plate for their own use.
50	CHICAGO STAMPING CO	CHICAGO, ILL	5				
51	CINCINNATI CORRUGATING CO	PIQUA, OHIO	1			Piqua.	Make bright plate for their own use.
52	FERGUSON TIN PLATE CO	EAST LIBERTY, PA	5			Ferguson's Extra Coated, Ferguson's Old Style, Ferguson's Redipped, Lima Redipped, Magnet, Volcano.	
53	FOLLANSBEE BROS. CO	ALLEGHENY, PA	5	Clifton, Finest	Furnace	Allegheny, Braddock, Duquesne, Kenton, Lionel, Neville Old Style, Oakmont, Old Reliable Redipped, Orbit Redipped, Pittsburgh, Protection Old Process, Raymond, Scott's Extra Coated, Sherwood, Thurso, Triumph Old Method.	
54	HAMILTON, JOHN	PITTSBURGH, PA	3	Ivy, Pansy	Pink	Bonus, Fort Pitt, G. A. R., Hamilton's Best Redipped, Hamilton's Excelsior Hand Coated, Hazlewood, Killbuck, Lulu, Mingo Old Process, Osceola Old Style.	
55	LAUFMAN (P. H.) & CO., LIMITED	APOLLO, PA	2			Laufman's Apollo.	
56	LAUFMAN TIN PLATE CO	BUTLER JUNCTION, PA	4			Allegheny, Freeport, Laufman's Apollo, Tip Top.	
57	MCDONALD (THE JAS.) & SONS CO	CINCINNATI, OHIO	2			Eureka, Special, The J. McD. & Sons Old Style.	
58	MERCHANT & CO., INCORPORATED	PHILADELPHIA, PA	8	Florence, Minerva, Palma, Pisa, Spa, Violet	Leslie, Rose	Alaska, American Old Style, Arch, Camaret, Elsie, Emlyn, Empire Hand Coated, Hickory, Kismet, Merchant's Old Method, Merchant's Roofing, Palm, Special Extra Coated, Stanley, *Tandem.	
59	MEURER BROS. CO	BROOKLYN, N. Y	8	Florida, Howard	Albert, Brooklyn	Excelsior, Flushing, Grace, Meurer's Genuine Tinned Iron Sheets, Meurer's Old Method, Meurer's Roofing, Pullman, Standard, Superior.	*Continuous roofing.
60	NIVIN & HASSARD TIN PLATE CO	PHILADELPHIA, PA	3	H. P., Jewel, Rambler		Dandy, Echo, Nivin & Hassard New Method, N. & H. Roofing, Old Method, Sensation.	
61	NORRISTOWN TIN PLATE CO	NORRISTOWN, PA	6			Norristown New Method.	
62	NORTON BROS	MAYWOOD, ILL	18				
63	NORTON TIN PLATE & CAN CO	BALTIMORE, MD	16				Make bright plate for their own use.
64	OLD DOMINION IRON & NAIL WORKS CO	RICHMOND, VA	3	Belle Isle, Belmont	Bellevue, Belona	Albemarle, Cherokee, Chesapeake, Greenbrier, Indian, Kanawha, Mohawk, Pawnee, Potomac, Rivanna, York.	Make bright plate for their own use.
65	PHILLIPS TIN PLATE CO., INCORPORATED	PHILADELPHIA, PA	5	Century, Oak	Gladys, Walnut	Boston, Boston Old Method, Columbus, F. R. P. Extra, National, Phillips' Roofing, Republic, Zero.	
66	READING TIN PLATE CO	READING, PA	2			America. C. H., H. M., Horton, L. C., Mt. Penn, Reading Roofing, Spring.	
67	RECORD MFG. CO	CONNEAUT, OHIO	2	Record Charcoal A1, Record Charcoal A	Record Coke.		
68	SIMPSON (W. T.) & CO	CINCINNATI, OHIO	3			Boaz, Queen City Old Style, Riverside.	
69	TAYLOR (N. & G.) CO	PHILADELPHIA, PA	22	Brilliant, Hand Dipped, Linden, Merion, Royal	Almond, Locust, Mint	Columbia, Globe, Knoxall, Maple Old Method, Spruce, Taylor Old Style, Taylor Roofing Tin, Willow.	
70	TROTTER (NATHAN) & CO	PHILADELPHIA, PA	3			Elziver, Enid, Sharon, Triumph, Trotter's New Method, Trotter's Roofing, Trotter's Special, Verona.	
71	WHEELING CORRUGATING CO	WHEELING, W. VA	6	Ewing, Fort Henry, Wheeling	Thayer	Eleanor, Heaven, Margaret, Nelson, Wylie.	Operation suspended.
	Total Tinning Sets		164				

CAMBRIDGE ..... Cambridge Mfg. Co., Cambridge, Ohio.
CAPITAL ..... E. L. Parker & Co., Baltimore, Md.
CENTRAL ..... A. A. Thomson & Co., New York.
CHALLENGE ..... Wells & Nellegar Co., Chicago.
CHEROKEE ..... J. L. Perkins & Co., Chicago.
CHERRY ..... E. L. Parker & Co., Baltimore, Md.
CHESTER ..... E. L. Parker & Co., Baltimore, Md.
CLEVELAND ..... W. C. Nimmo & Co., Baltimore, Md.
CLIMAX ..... Gummey, McFarland & Co., Philadelphia, Pa.
CLOVER LEAF ..... Wyeth Hardware Co., St. Joseph, Mo.
COE O. S ..... James A. Coe & Co., Newark, N. J.
COIN ..... W. C. Hopson & Co., Grand Rapids, Mich.
COMPETITION ..... Gedge Bros. Iron Roofing Co., Anderson, Ind.
CONTINENTAL ..... Gummey, McFarland & Co., Philadelphia, Pa.
CORT'S EXTRA ROOFING, CORT'S OLD STYLE, CORT'S NEW METHOD ..... Mortimer H. Cort, New York.
COWBOY ..... Peden & Co., Houston, Texas.
CROWN OLD STYLE ..... Illinois Roofing & Supply Co., Chicago.
C. S. R. Co. CANTON, C. S. R. Co. FARGO ..... Canton Steel Roofing Co., Canton, Ohio.
CYCLE ..... Bruce & Cook, New York.
DAISY ..... E. E. Souther Iron Co., St. Louis, Mo.
DALKEITH ..... Hibbard, Spencer, Bartlett & Co., Chicago.
DASSO ..... Illinois Roofing & Supply Co , Chicago.
DELL ..... E. L. Parker & Co., Baltimore, Md.
DELMAR ..... Simmons Hardware Co., St. Louis, Mo.
DE MILT'S CHAMPION, DE MILT'S FIRST NEW YORK, DE MILT'S MANHATTAN ..... H. R. De Milt & Co., New York.
DENNIS ..... W. F. Janeway, Columbus, Ohio.
DERBY ..... E. L. Parker & Co., Baltimore, Md.
DIXIE OLD PROCESS ..... Southern Ry. Supply Co., Richmond. Va.
DOTEN ..... Austen & Doten, Boston, Mass.
EAGLE ..... Gummey, McFarland & Co., Philadelphia, Pa.
EARNEST ..... T. B. Coddington & Co., New York.
ECONOMY ..... Simmons Hardware Co., St. Louis, Mo.
E L ..... Hoy & Co., Albany, N. Y.
E. L ..... Illinois Roofing & Supply Co., Chicago.
ELECTRIC CITY ..... Wyeth Hardware Co., St. Joseph, Mo.
ELI ..... Illinois Roofing & Supply Co., Chicago.
ELLIS ..... Bruce & Cook, New York.
EMORY ..... W. F. Janeway, Columbus, Ohio.
EMPIRE STATE ..... Mortimer H. Cort, New York.
EPTOL ..... McClure & Co., Pittsburgh, Pa.
ERIE ..... Letcher & Norton, Jersey City, N. J.
EUREKA ..... J. M. & L. A. Osborn, Cleveland, Ohio.
F. H. L. Co ..... The F. H. Lawson Co., Cincinnati, Ohio.
FLAG ..... Gummey, McFarland & Co., Philadelphia, Pa.
F. M. S ..... Stratton & Terstegge, Louisville, Ky.
FOREST, FOREST NEW METHOD ..... Letcher & Norton, Jersey City, N. J.
FRANKLIN ..... Peden & Co., Houston, Texas.
FRANKLIN NEW METHOD ..... W. F. Janeway, Columbus, Ohio.
FREEHOLD ..... McClure & Co., Pittsburgh, Pa.
FULTON ..... E. L. Parker & Co., Baltimore, Md.
FURMSTON ..... C. Sidney Shepard & Co , Chicago.
GARLAND OLD STYLE ..... McClure & Co , Pittsburgh, Pa.
GEDGE CROSS, GEDGE REDIPPED ..... Gedge Bros. Iron Roofing Co., Anderson, Ind.
GENUINE L. C. Co.'s REDIPPED ..... Lyon, Conklin & Co., Baltimore, Md.
GLENDALE ..... Lyon, Conklin & Co., Baltimore, Md.
GOLDEN STAR OLD STYLE ..... J. M. & L. A. Osborn, Cleveland, Ohio.
GROVE ..... Letcher & Norton, Jersey City, N. J.
HANDCO ..... Hoy & Co., Albany, N. Y.
HAROLD NEW METHOD ..... W. F. Janeway, Columbus, Ohio.
HARVARD ..... Austen & Doten, Boston, Mass.
H. B. L. OLD STYLE ..... Hibbard, Spencer, Bartlett & Co , Chicago.
HERCULES ..... Gummey, McFarland & Co., Philadelphia, Pa.
HERCULES ..... Witte Hardware Co., St. Louis, Mo.
HONEY SUCKLE ..... E. E. Souther Iron Co., St. Louis, Mo.
HOUSTON ..... Peden & Co., Houston, Texas.
HUDSON NEW METHOD ..... Letcher & Norton, Jersey City, N. J.
HUNTER ..... Lyon, Conklin & Co., Baltimore, Md.
HUSTLER ..... Illinois Roofing & Supply Co., Chicago.
IDEAL ..... E. L. Parker & Co., Baltimore, Md.
ILLINOIS OLD METHOD ..... Illinois Roofing & Supply Co., Chicago.
IRON OLD WAY ..... Lyon, Conklin & Co., Baltimore, Md.
IROQUOIS ..... Hibbard, Spencer, Bartlett & Co., Chicago.
JERSEY OLD STYLE ..... J. L. Perkins & Co., Chicago.
JESSIE ..... Illinois Roofing & Supply Co., Chicago.
J. R. D. EXTRA ..... J. L. Perkins & Co., Chicago.
JUPITER ..... Simmons Hardware Co., St. Louis, Mo.
JUPITER ..... Stratton & Terstegge, Louisville, Ky.
KENWOOD ..... C. Sidney Shepard & Co., Chicago.
KEYSTONE ..... McClure & Co., Pittsburgh, Pa.
KLONDIKE ..... Peden & Co., Houston, Texas.
KRONER'S BEST ..... La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
LAWSON'S OLD PROCESS ..... The F. H. Lawson Co., Cincinnati, Ohio.
LEADER, LEDGER ..... E. L. Parker & Co., Baltimore, Md.
LEOMINSTER ..... Gummey, McFarland & Co., Philadelphia, Pa.
LEONA OLD STYLE ..... J. M. & L. A. Osborn, Cleveland, Ohio.
LEONA OLD STYLE ..... J. L. Perkins & Co., Chicago.
LIBERTY ..... Gummey, McFarland & Co., Philadelphia, Pa.
LILLIAN ..... W. C. Nimmo & Co., Baltimore, Md.
LOWERY ..... W. F. Janeway, Columbus, Ohio.
LURAY ..... E. L. Parker & Co., Baltimore, Md.
MAGNOLIA ..... Peden & Co., Houston, Texas.
MASCOTTE ..... Stratton & Terstegge, Louisville, Ky.
McCLURE'S REDIPPED, McCLURE'S ROOFING ..... McClure & Co., Pittsburgh, Pa.
MODEL ..... E. L. Parker & Co., Baltimore, Md.
MODOX ..... Lyon, Conklin & Co., Baltimore, Md.
MORGAN ..... E. S. Wheeler & Co., New Haven, Conn.
MORITA ..... J. L. Perkins & Co., Chicago.
NAVA ..... J. M. & L. A. Osborn, Cleveland, Ohio.
NELLEGAR OLD STYLE ..... Wells & Nellegar Co., Chicago.
NIAGARA ..... Hibbard, Spencer, Bartlett & Co., Chicago.
NIMMO EXTRA COATED, NIMMO OLD STYLE ..... W. C. Nimmo & Co , Baltimore, Md.
O. B. T. EXTRA COATED ..... McClure & Co., Pittsburgh, Pa.
OCRACOKE ..... Southern Ry. Supply Co., Richmond, Va.
OHIO ..... The F. H. Lawson Co., Cincinnati, Ohio.
OLD COLONY ..... A. A. Thomson & Co., New York.
OLD METHOD F. R. L ..... The F. H. Lawson Co., Cincinnati, Ohio
OLD PROCESS ..... Hibbard, Spencer, Bartlett & Co., Chicago.
OLD STYLE P ..... The F. H. Lawson Co., Cincinnati, Ohio.
OLNEY ..... Brown & Wales, Boston, Mass.
ORIOLE ..... E. L. Parker & Co., Baltimore, Md.
OSBORN'S GUARANTEED OLD STYLE, OSBORN'S OLD METHOD, OSBORN'S OLD STYLE PONTY, OSBORN'S ROOFING ..... J. M. & L. A. Osborn, Cleveland, Ohio.
PARKER'S OLD STYLE, PARKER'S TRIPLE COATED. ..... E. L. Parker & Co., Baltimore, Md.
PAVONIA ..... Letcher & Norton, Jersey City, N. J.
P. B. H ..... Bruce & Cook, New York.
PECOS ..... J. L. Perkins & Co., Chicago.
P. E. D. OLD STYLE ..... J. L. Perkins & Co., Chicago.
PEDEN'S BEST OLD STYLE ..... Peden & Co., Houston, Texas.
PENN OLD METHOD, PENNSYL OLD METHOD ..... Gummey, McFarland & Co., Philadelphia, Pa.
PERFECTION ..... E. L. Parker & Co., Baltimore, Md.
PETREL ..... Bruce & Cook, New York.
PHELPS' EXTRA, PHELPS' TREBLE COATED. ..... Phelps, Dodge & Co., New York.
PHOENIX, PIONEER ..... Gummey, McFarland & Co., Philadelphia, Pa.
PILGRIM OLD STYLE ..... E. S. Wheeler & Co., New Haven, Conn.
PLYMOUTH ..... Austen & Doten, Boston, Mass.
P. N. A. TREBLE COATED ..... Bruce & Cook, New York.
PONTARTAWE ..... Hibbard, Spencer, Bartlett & Co., Chicago.
PREMIER ..... E. L. Parker & Co., Baltimore, Md.
P. R. P. REDIPPED ..... Williams & Co., Columbus, Ohio.
PYOTE ..... J. L. Perkins & Co., Chicago.
RAY ..... Illinois Roofing & Supply Co., Chicago.
RENO ..... Mortimer H. Cort, New York.
SALEM ..... E. L. Parker & Co., Baltimore, Md.
SELAW ..... Brown & Wales, Boston, Mass.
SENATE ..... E. L. Parker & Co., Baltimore, Md.
SEVERN ..... E. L. Parker & Co., Baltimore, Md.
SENECA, SHEPARD'S OLD STYLE ..... Sidney Shepard & Co., Buffalo, N. Y.
SHERMAN, SHERMAN OLD STYLE ..... E. S. Wheeler & Co., New Haven, Conn.
SOUTHERN CROSS ..... Southern Ry. Supply Co., Richmond, Va.
SPALDING ..... Illinois Roofing & Supply Co., Chicago.
SPECIAL ..... Gedge Bros. Iron Roofing Co., Anderson, Ind.
SPOKANE ..... Stratton & Terstegge, Louisville, Ky.
S. & T. EXTRA COATED, S. & T. OLD TIME ..... Stratton & Terstegge, Louisville, Ky.
STAFFORD ..... E. L. Parker & Co., Baltimore, Md.
STANDARD ..... E. L. Parker & Co., Baltimore, Md.
STAPLE ..... James A. Coe & Co., Newark, N. J.
STAR OLD STYLE ..... J. M. & L. A. Osborn, Cleveland, Ohio.
STELLAR ..... E. L. Parker & Co., Baltimore, Md.
STERLING OLD STYLE ..... Gummey, McFarland & Co , Philadelphia, Pa.

SUPERIOR NEW METHOD	W. C. Hopson & Co., Grand Rapids, Mich.
SWAN	Sidney Shepard & Co., Buffalo, N. Y.
THOMSON'S PURITAN	A. A. Thomson & Co., New York.
THRIFT	W. C. Hopson & Co., Grand Rapids, Mich.
TOYAH	J. L. Perkins & Co., Chicago.
TUXEDO	W. C. Nimmo & Co., Baltimore, Md.
VENUS, VICTOR	Gummey, McFarland & Co., Philadelphia, Pa.
VIOLA	Peden & Co., Houston, Texas.
WALDO	Gummey, McFarland & Co., Philadelphia, Pa.
WALES SPECIAL	Brown & Wales, Boston, Mass.
WARSAW	E. L. Parker & Co., Baltimore, Md.
WAYNE HAND COATED	Lyon, Conklin & Co., Baltimore, Md.
WESTMORELAND	C. Sidney Shepard & Co., Chicago.
W. & H. REDIPPED	Williams & Co., Columbus, Ohio.
WHEELER'S IMPROVED METHOD	E. S. Wheeler & Co., New Haven, Conn.
WILLIAMS OLD STYLE	Williams & Co., Columbus, Ohio.
WILTON EXTRA	Stratton & Terstegge, Louisville, Ky.
W. T. R.	Bruce & Cook, New York.
WYETH OLD STYLE	Wyeth Hardware Co., St. Joseph, Mo.
X. L. C. R	Gummey, McFarland & Co., Philadelphia, Pa.
YORK	Letcher & Norton, Jersey City, N. J.
ZONE	Gummey, McFarland & Co., Philadelphia, Pa.

The British Tin Plate Industry in 1897.

In its review of the British iron and steel industries for the year 1897 the *Iron and Coal Trades Review* of London includes the following remarks regarding the tin plate industry:

The tin plate industry has had an exceptionally checkered career during 1897. Several times during the year it looked as if there was likely to be a considerable revival of demand; but these prospects have been dashed again and again by renewed depression, so that the mills have been worked with rather more irregularity than usual. The exports rose from a total of 18,218 tons in December of 1896 to one of 28,201 in March of 1897. This advance, however, was not maintained during the later periods of the year, and in July, which should have been a good shipping month, the exports fell again to only 18,235 tons, from which point no material rise took place until November, when an export of 24,145 tons was recorded. The total exports of tin plates for the first 11 months of the year were 250,736 tons, against 248,737 tons for the first 11 months of 1896 and 332,547 tons for the first 11 months of 1895.

An indication of the irregular manner in which the tin plate works in South Wales were employed is furnished by the following table:

Number of Mills in the Tin Plate Works that Have Made Returns to the Board of Trade at the End of Each Month—November, 1896, *to October*, 1897.

Month.	Mills working.	Mills not working.	Total.	No. of works reporting.
1896.				
November	261	229	490	89
December	328	164	492	89
1897.				
January	332	155	487	87
February	334	149	483	87
March	320	167	487	88
April	307	180	487	88
May	302	186	488	88
June	273	215	488	88
July	272	207	479	87
August	275	209	484	88
September	273	211	484	87
October	306	170	485	87
November	325	159	484	86

It will be observed that in the months of November and December of 1896 two more works reported than in any of the months of 1897, which explains the large number of mills recorded. The comparative steadiness in the number of works reporting during the remainder of the year, however, guarantees to a large extent that the figures given for the mills are parallel and relevant to each other. There appears to have been a marked revival of business in December, 1896, when the number of operative mills rose to 328, against 261 in the previous month. In February of 1897 the number of operative mills had increased to 334, which was a record figure for the year. In July the number of mills working had fallen to 272, but in October again, with the same number of works reporting, the number had increased to 306.

Rope transmission of power will be employed in the plant of the Shenango Tin Plate Company, now under construction at New Castle, Pa.

The Ferguson Tin Plate Company have decided not to remove their dipping plant from East Liberty to Uniontown, Pa., as was contemplated. It is possible that the company in the near future may erect a rolling mill plant for the production of their own Black Plate at some other location.

The prolonged strike and lockout among the window glass workers of the Indiana gas belt is at an end, arrangements having been made to start up all the factories next week. About 15,000 men, who have been idle since July, will return to work at an advance of from 13 to 17 per cent. over last year's wages.

New Publications.

COPPER MANUAL.—Published by D. Houston & Co., 25 Platt street, New York. Price, $2.

D. Houston & Co., who have been conspicuous as copper brokers, and who issue an admirable monthly review of the copper situation, have published a handsomely printed volume entitled "Copper Manual." General information concerning the copper industry of the United States is presented, together with more detailed data relative to the leading producing companies—the Anaconda, Boston & Montana, Calumet & Hecla, Quincy, Tamarack, Atlantic, Central, Franklin, Wolverine, Kearsarge, Butte & Boston and Centennial. We note also a sketch of the Orford Copper Company, a review of the Arizona mines, and information concerning the three great concerns of the Spanish Peninsula, the Tharsis, Rio Tinto and Mason & Barry. In many cases these descriptions are accompanied by handsome plates of the plants of the mines and photographs of the leading men connected with them. A list of the brass and copper rolling mills of the United States is published, followed by a historical sketch of some of the great plants of the Naugatuck Valley, among them being the Benedict & Burnham Mfg. Company, the Coe Brass Mfg. Company, Randolph & Clowes, the Waterbury Brass Company and Holmes, Booth & Haydens.

Coal or Coke Basket.

A coal or coke basket, which the J. W. Paxson Company, Pier 45 N. Delaware avenue, Philadelphia, are offering, is illustrated herewith. The basket has an iron frame



Fig. 1.—Coal or Coke Basket.

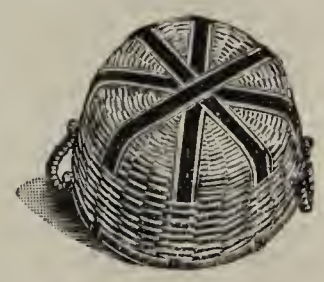


Fig. 2.—Bottom View of Basket.

interwoven with hickory, which it is claimed insures strong and durable construction. The basket is designed particularly for use in coal yards, foundries, steamships &c., and is supplied in four sizes.

New Railways in 1897.

The *Railway Age* of Chicago makes the following statement regarding new railway lines built in the United States in 1897:

While the year 1897 has shown larger railway earnings and better business conditions than its immediate predecessors the marked improvement in the financial outlook did not begin early enough in the year for the completion of many new railway undertakings, and so it now appears that, although much construction work is under way the mileage of track actually laid is but little greater than that for the preceding year.

The lowest point in 20 years in respect to railway building was reached in 1895, when only 1803 miles of track were added, and 1897 has done a little better, the total now reported to us being 1864 miles. California stands first, with 210 miles laid on different roads, and no track was laid in New Hampshire, Rhode Island, Connecticut, Maryland, Kansas, Nebraska, New Mexico, Indian Territory, Arizona, Wyoming and Nevada, and five others barely escaped from this category. At the commencement of 1898 the United States will have 184,464 miles of completed railway.

THE RETAIL STORE.

Tinware and House Furnishing Goods.

To the makers of tinware, enameled ware and house furnishing goods generally the past year brought a substantial expansion in the volume of their business over 1896. The increase in the amount of goods sold, while varying with the different concerns, may be put down at an average of about 20 to 25 per cent. Unfortunately, however, the course of prices has been in an inverse ratio to the volume of business transacted. Consequently the final result in dollars and cents was by no means commensurate with the increase in the amount of goods distributed. A slim margin of profit is the subject of general complaint among those engaged in making and marketing house furnishing goods. Competition has become sharper as the output has increased, and profits have been pared down so close as to have nearly reached the vanishing point in some lines. This is true both of tinware and enameled ware.

Enameled Ware.

A feature of the year has been the rapidly growing displacement of tin utensils by enameled goods in the domestic economy of all classes. The fact of a number of new concerns having embarked in the manufacture of enameled ware has brought about so much competition in this line that prices of enameled ware have been cut down to about the level at which tinware was sold a short time back. The cheapness of enameled ware now places it within the reach of all, and the demand has increased enormously in consequence. At the same time the production of the cheaper qualities of these goods has expanded so materially that it has outrun the consumption, with the result of the keen competition and close cutting of prices before alluded to. To obviate this state of things, and secure a fair profit on the business, a movement was set on foot toward the end of the year looking to a combination among the manufacturers of enameled and stamped ware. A number of meetings and conferences were held, and the matter was fully canvassed, with the result, as is understood, that most of the concerns in the business have expressed themselves as being ready to join the proposed combination. Two or three of the largest interests, however, are still holding aloof, and no final arrangements have yet been made.

Manufacturers' Views.

We have received a number of interesting reports from firms engaged in the manufacture of house furnishing goods in various parts of the country, extracts from some of which are appended:

A large concern manufacturing stamped and pieced tinware and enameled ware write as follows: Our business is about 25 per cent. ahead of last year up to the present time. Profits on the staple articles in our line have been cut closer than ever before, and the prices are lower. We can see no reason why next year's business should not be equal to this, or why it should be more. If prices continue to decline as they have done during the fall of the year (notwithstanding most of the manufacturers in our line, as far as we know, have been busy) it will be a hard matter to figure any profit out of the business. We do not see how the prices can be put on a higher level without some concerted action on the part of the manufacturers. In some lines indications point to co-operation, but this does not apply to the complete line of goods.

A company in the Eastern States making a large line of tin, brass, copper and nickel plated ware, say: We are just closing a very busy year. There has been an increasing demand for all our products since early spring, and although we do not consider that "prosperity" is yet in full swing, we are greatly encouraged by the volume of business done. All our salesmen report the country in first-class shape, especially the West, and predict still better times for 1898. Collections are very good, and we have had few failures in comparison with former years. We look forward to a very prosperous season next year.

Another Eastern tinware concern say that the volume of their sales during the year has been materially increased. Collections have been, on the whole, easier to make and more satisfactory than during 1896. Competition, however, has been very keen. They anticipate a considerable improvement during 1898.

A concern making high grade metal household goods in the East write as follows: Our business has been much greater in volume this year than last, owing, possibly, to the better financial times throughout the country, and the demand on the part of the great wage earning class for a good article, such as we make, when obliged to buy house furnishing goods of this sort. We consider prospects for the coming year very bright, although profits must necessarily depend upon the volume of business rather than upon large margins on small volume. We do not think prices which have been cut down will ever be recovered in our line, as the supply bids fair to be always greater than the demand; but we think there is a good chance for new articles of one sort or another, and there is no reason why they should not bring profitable prices until competition sets in and drives them down.

THE PACIFIC COAST.

The Pacific Sheet Metal Works, San Francisco, Cal., write us as follows: For the past year on the Pacific Coast there has been a fairly good business in packers' cans and in the general manufacture of tin products; but while the volume of business has been very good, the margin of profits has been closer than in previous years. At the present time there are on the Pacific Coast eight establishments for the manufacture of packers' cans, where but two existed a few years since, and as the field for consumption is limited, necessarily competition has become very active. Regarding the prospects for trade during the coming year, while it is dangerous to prophesy as to what may occur, yet from the present outlook there should be a good demand, both from packers and from the general trade. The discovery of the gold fields in northern Alaska has stimulated all kinds of business on this coast, and the branch that we are engaged in will probably feel some of the beneficial effects of increased demand. Collections have been fairly good, and most of the people that we are brought in contact with seem to be living on "Easy street."

Aluminum Utensils.

A material reduction in the price of aluminum which took place during the year has stimulated the use of household utensils of that metal to some extent. Aluminum ware, however, has not made the rapid progress in public favor that was expected of it, although its real merits are becoming more generally appreciated by the people. The price of the ware, while considerably lower than it was a year ago, is still too high to bring it into competition with tin and enameled ware, so that it remains out of reach of the majority of householders. The large department stores which handle these goods report an improved demand for them during the latter half of the year. Considerable progress has been made by the

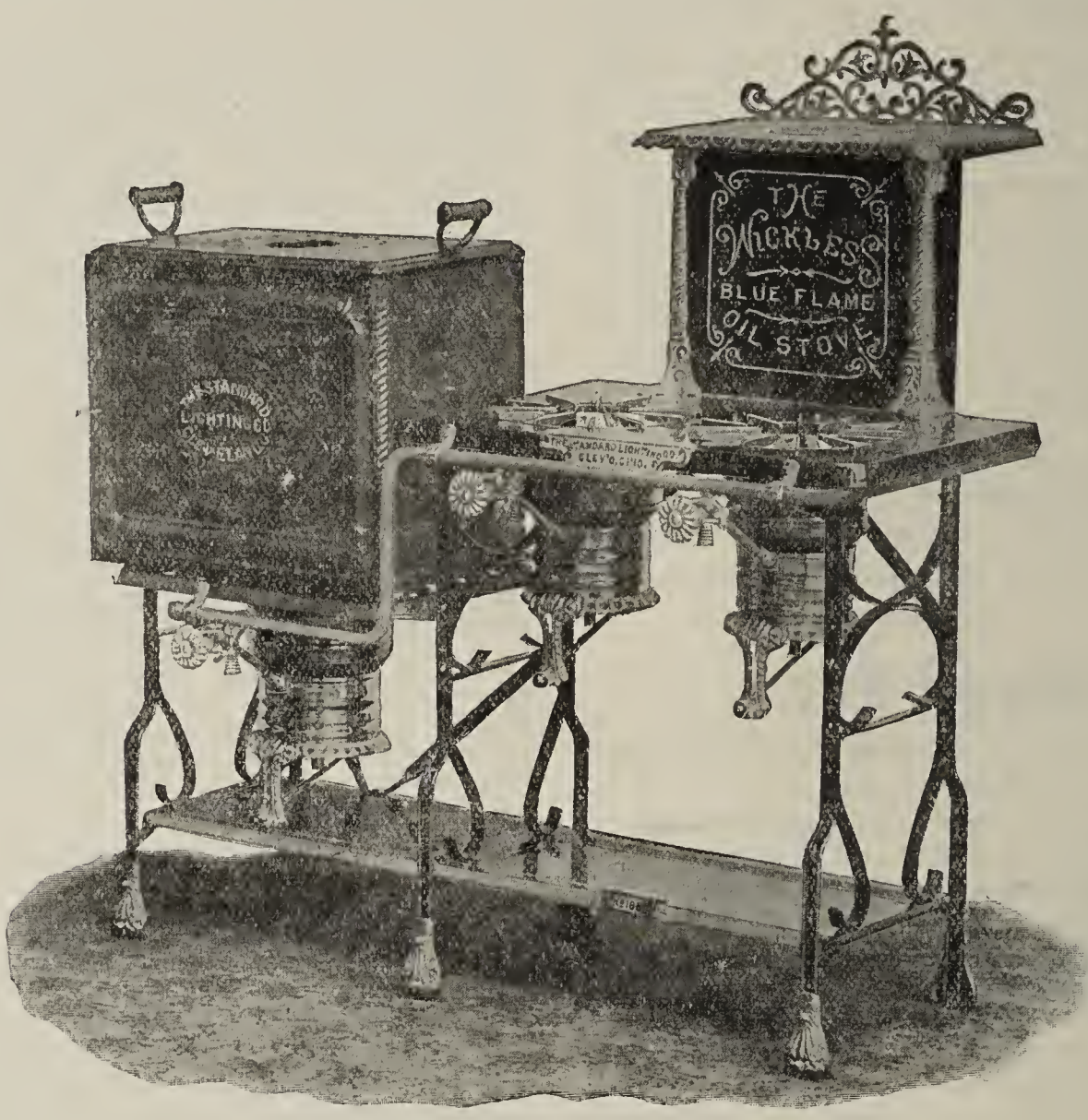
manufacturers of aluminum utensils in the improvement of their product, and the lines now on the market embrace almost every article made in tin or other metal. The outlook for an increasing trade in aluminum ware during the coming year is considered very favorable.

North Dakota Retail Hardware Association.

The second meeting of the North Dakota Retail Hardware Association will be held at Fargo on Wednesday, February 16. This association was organized in that city on September 29 last, and now has a membership of something over 100 exclusive Hardware dealers. There are 190 such merchants in the State, so that the association already comprises a majority of the Hardwaremen of North Dakota. A membership committee, composed of one member from every county in which there is a Hardware dealer, has been appointed. The Fargo meeting promises to be an interesting one, as matters of much importance are to be up for discussion. We understand that the association has taken up the matter of sales to catalogue houses and department stores in their State by jobbers and manufacturers, and that a large number of them have promised to support the association. If these promises are adhered to, and the members of the organization do their part, confidence is felt that the association will accomplish the end they have in view. Clark W. Kelley of Devil's Lake is president of the association and C. N. Barnes of Grand Forks is secretary.

A Wickless Oil Stove.

For several years a number of minds have been at work trying to produce a burner for a coal oil cook stove that would burn without a wick. We herewith show a cut of a wickless oil stove, Fig. 1, made by the Standard Lighting Company of Cleveland, Ohio, also a sectional cut, Fig. 2, showing the operation of the burner. The reservoir is constructed on the student lamp principle, and connected to ½-inch pipe which passes around to the front of the stove. The oil is then fed from this pipe to the burner through a valve into a ⅜-inch pipe to the channel of the burner, saturating a brass gauze starting ring. When this ring is saturated a light is applied to it and the burner is ready for use, but it requires about two or three minutes after lighting to develop a full sized flame. A special feature of this burner is that oil, and not vapor, is burned. All parts of the burner are readily removable, interchangeable and easily kept clean. This stove is made in ten different sizes, and admits of drawing the fuel for both heating and lighting from the same barrel.



A Wickless Oil Stove.—Fig. 1.—General View.

The well-known house of George Tritch Hardware Company, Denver, Col., will start the new year by adding a complete stock of Sporting Goods to their large and comprehensive line of Hardware. The company refer to their intention of meeting the wants of their many customers in the Rocky Mountain section as efficiently in this line as in the other departments of their business. They advise us that they would be pleased to hear from all manufacturers of goods of this class.

E. A. Rea, dealer in Hardware, Agricultural Implements, Stoves, Tinware, Harness, Seeds, &c., Corydon, Wayne County, Iowa, is just completing a new warehouse in the rear of his present store building. The warehouse is of brick, two stories high, 60 feet wide by 184 feet in length. Mr. Rea's present building, also of brick, is 40 x 160 feet, two stories, with basement. The new building, joining the old, will make a total length of 344 feet. Mr. Rea also conducts a branch store at Chariton.

Fraser & Nolan have purchased the Hardware business of James & Son, Napa, Cal. Some changes have been made in the establishment and the counters now run lengthwise with the store instead of across, as formerly. Besides handling Hardware, Stoves, Implements, &c., the firm have a plumbing and tinning department, under the management of Mr. Nolan.

Sims & DeLon have succeeded Sims, Richards & Richards in the Hardware line in Russiaville, Ind. The stock carried comprises Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, &c.

W. H. Mandeville has purchased the interest of V. D. Lobdell in the firm of Mandeville & Lobdell, 1003 and 1005 South Main street, Rockford, Ill., and will continue the business under his own name. The stock includes Hardware, Tinware, Stoves, &c.

Geo. Mayer Hardware Company, Denver, Col., have removed to more commodious quarters at 1512 to 1520 Arapahoe street, where they are in much better position to conduct the wholesale and retail business in Hardware, Stoves, Cutlery, Bicycles, &c. They will be pleased to hear from manufacturers with catalogues, quotations, &c.

MEMORANDA.

I. J. Clabaugh, dealer in Hardware, Tinware, Harness, Agricultural Implements, &c., New Hampton, Mo., is now comfortably settled in his new building, which is 24 feet wide by 70 feet in length.

Chas. S. Johnson, Barberton, Ohio, has doubled his storeroom space by taking in adjoining premises. Mr. Johnson advises us that he has added considerably to his former large stock of Hardware, House Furnishing Goods, Farm Implements, Stoves, &c. Business is referred to as excellent.

Otto J. Baertich has purchased the entire interest of his father, Herrman Baertich, in the Hardware business in Troy, Ind. Mr. Baertich makes a specialty of Heating and Cooking Stoves and Ranges, and handles also a full line of Agricultural Implements, Tinware, &c.

W C. Allison has succeeded Allison & Boyington in the Hardware business in Muscoutah, Kan. Mr. Allison's line covers Shelf Hardware, Stoves, Tinware, Agricultural Implements, Buggies, Sporting Goods, &c.

John Conwell of Xenia, Ohio, will shortly open up a Hardware store in Spring Valley, Ohio. The business will be conducted under the style of the J. C. Conwell Company, and the stock will comprise Shelf Hardware, Stoves, Tinware, Agricultural Implements, &c.

William Love, retail dealer in Shelf Hardware, Tinware, Stoves, Garden Implements, &c., 1659 Main street, Buffalo, N. Y., has lately installed new shelving in his store. Mr. Love has also adopted a system of burglar protection in view of a recent visit of thieves. He has also just commenced the use of natural gas for illuminating purposes. Mr. Love reports a good condition of business, improvement being noted over the same period of last year.

During the past year the American Stamping Company, Brooklyn, N. Y., have greatly increased their facilities for making Enameled Ware by the addition of new buildings and machinery. They contemplate still further additions in the near future.

The W. H. Sweeney Mfg. Company, manufacturers of Tin, Brass, Copper and Nickel Plated Ware, Brooklyn, N. Y., are making several changes in their factory, which will enable them to increase their output considerably. The company look forward to a very busy season next year.

The Enterprise Enamel Company have recently organized at Bellaire, Ohio, for the manufacture of Enameled Hollow Ware. William Lephardt is president of the company, C. L. Doon vice-president, Theo. Rossbock general manager and Jas. F. Du Bois secretary and treasurer.

Small circulars sent out by the Morgan Mfg. Company, 112 Dearborn street, Chicago, Ill., call attention to some of the specialties of this concern. One relates to the Morgan Broiler, another to the Morgan Steam Egg Poacher and a third to the Sun Pan Cake Griddle.

John Quaritius, Hicksville, L. I., has installed Hot Air Furnaces in the fine residence of C. C. J. Grohmann, Central Park, and in the residence of Matthew McGunnigle.

Joseph F. Romberger, Berrysburg, Pa., who has been in the general merchandise business for 30 years, has opened up a new Hardware store in that place. Mr. Romberger is handling Stoves, Tinware and Agricultural Implements in connection with a line of Shelf Hardware.

W. H. Cowan has succeeded Millsap & Co. in the retail Hardware and Tinware business in Boston, Ark.

H. W. Diers has moved his Tin business from Belle Plaine, Minn., to Roberts, Wis., where he has added a line of Hardware and Stoves to his former stock.

Manning & Hall have succeeded Baker & Hall in the retail Hardware, Stove, Tinware, Agricultural Implement and Sporting Goods business in Gypsum, Kan.

E. M. Lang & Co., 71 Kennebec street, Portland, Maine, manufacturers of Wire, Drop and Stick Solder, have incorporated under the name of E. M. Lang Com pany. They began business under the new title December 15.

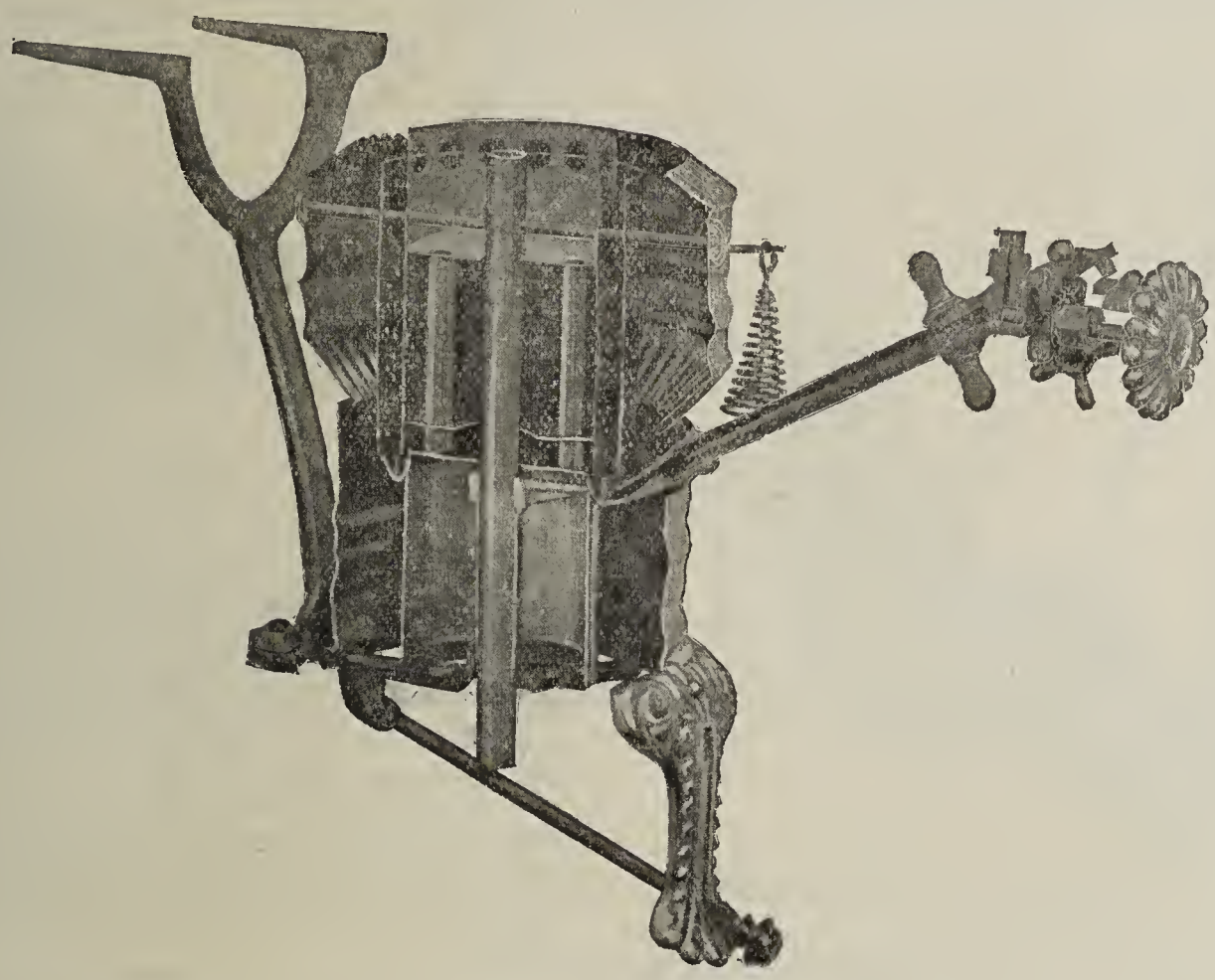


Fig. 2.—Section through Burner.

Stowell Mfg. & Foundry Company, South Milwaukee, Wis., have issued a new catalogue of 128 pages, cloth bound, devoted to Hardware, Door Hangers and Rail, Warm Air Registers and Ventilators, Tackle Blocks, &c. A view of their large plant is presented as a frontispiece. In addition to the lines heretofore manufactured by them they illustrate new designs of Registers and Elevator Hangers, Badger Barn Door Hangers, Shoe Lasts and Stands, Ash Pit Doors and the Stowell Steel Parlor Door Hanger, calling special attention to the Stowell Hanger, which has, they state, made a name for itself in the less than a year it has been on the market. They also refer to the popular merits of their patent Self Locking Loose Axle. The company have added a new line of Plumbers' Supplies, consisting of Sinks, Cistern Covers, &c. Mention is also made of their facilities for fine japanning, light machine work, Gray Iron and Brass Castings, &c. Accompanying the book is the price-list of Hot Air Registers and Ventilators, which became effective December 20, 1897.

The great Coliseum in Chicago, which has housed a number of historic events in its brief career, was burned on Christmas eve. The loss was $350,000 on the building and perhaps as much more on exhibits which had been installed for a winter exhibition of all sorts of manufactured products. The building was totally destroyed and will not be replaced. Another project is now on foot to erect a much larger building of the same general character, for amusement purposes, national conventions, &c., to be located on the lake front, convenient to the heart of the city.

Palmers' Utopia Hammock.

I. E. Palmer, Middletown, Conn., is manufacturing an entirely new hammock, as shown in the accompanying

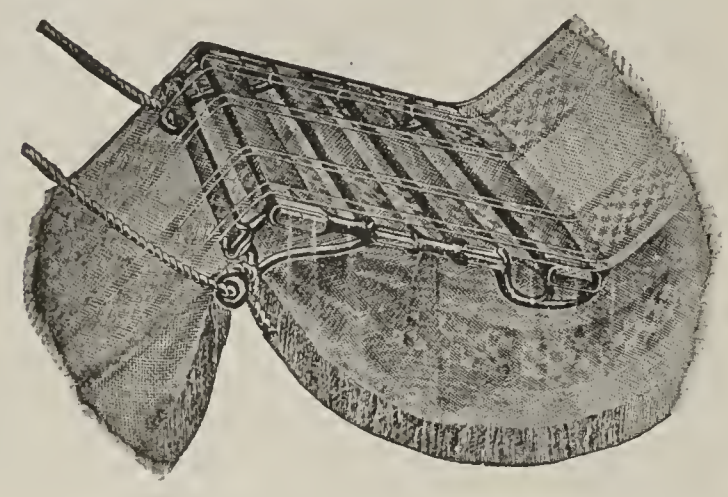


Fig. 1.—Sectional View of Seat of Utopia Hammock.

illustrations. This hammock is styled the Utopia, and is an addition to an already comprehensive line widely known. Fig. 1 is a sectional view showing the Utopia



Fig. 2.—Utopia Hammock Swung for Reading Position.

hammock seat, which is composed of two malleable iron sides, three fixed slats and two removable slats. For the purpose of varying the length between the seat and the



Fig. 3.—A Reclining Position.

pillow and for detaching the seat from the hammock, the front slat is made removable from the hammock body by pressing a spring similar in character to an umbrella spring at one of its ends. The body of the hammock is provided with a number of pockets in close proximity, for the purpose of receiving the removable slats for adjustment. The back slat is made removable only for the purpose of detaching the seat from the hammock, the pocket for this slat being made of sufficient length or width to admit of any desired adjustment of the seat by means of the front slat. The body of the hammock for receiving the seat is quite similar in general character to the regular Palmer hammock body. The features for adapting the body to the seat are simply the attachment of an under web to the hammock body proper, at such intervals as to form the required pockets. Ropes from an extra ring connect with the arms at the front of seat support and permit adjustment of seat and foot portion of hammock. Fig. 2 represents the occupant in a comfortable reading posture with arm supporters. The distance between the supporting rings may be varied according to the location of hanging and desired recline, ranging from 5 to 8 feet. Fig. 3 illustrates a reclining position, which may be altered at will to a more upright form by raising the head end and lower-



Fig. 4 —Full Reclining Position.

ing the opposite end at points of suspension, and *vice versa* if more recline is wanted. The feet may be raised or lowered by the extra side cord and sliding grip. In Fig. 4 is seen the full reclining position, which may be altered to sleeping position by lowering the head end. The illustrations, and in greater detail the catalogue of the manufacturer, give exact measurements for attaching cords so that different positions of the hammock may be secured without experimentation by the user. In 1883 Mr. Palmer introduced the Palmer woven hammocks, with pillow, spreader, divided suspension and other distinctive features, which are known as the Arawana and Perfection hammocks. Later he applied to the hammock the valance or ornamental drapery suspended fringe-like from the edges.

The Addyston Pipe & Steel Company state that they are having no trouble with the pipe which they are furnishing to the city of Chicago on their great contract. They attribute the reports in circulation relative to defective pipe to the rivalry between inspection bureaus. Up to the beginning of this week they had delivered 3000 pieces of pipe, of which four were broken in transit and were replaced, while six others were considered not quite up to the mark by their own inspector and were also replaced. The inspection is rigorous, but the company are living up to it without any difficulty and the Chicago authorities are stated to be thoroughly satisfied with the pipe which they are receiving.

There is some dissatisfaction existing at the present time among puddlers employed in the mills in the Pittsburgh and Valley districts. The present rate for puddling is $4 a ton, and the puddlers insist that the rate should not be below $4.50 a ton. They refer to recent advances made in wages of steel workers in support of their claim that higher prices should be paid for boiling. It is not likely, however, that any advance will be made in puddling before the time for the arrangement of the boiling scale in June next, and no advance may be made at that time.

The dividends of the Westinghouse interests at Pittsburgh, all payable in January, include $500,000 on stock of Westinghouse Air Brake Company, $75,000 on Philadelphia Natural Gas Company, $52,500 on first preferred stock of Westinghouse Electric & Mfg. Company, $40,000 on Allegheny Heating Company, $22,500 on Allegheny County Light Company and $7500 on Union Switch & Signal Company preferred stock.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Business of merely fair proportions is all that has been effected in this metal and wholesale prices have undergone only slight variation in the absence of any radical change in the London market. Jobbers continue to quote small parcels of Straits Pig from store at 14¾c. per lb. There has been fairly liberal importation since the beginning of the month, or about 1300 tons all told, and deliveries into consumptive channels barely reached late average proportions. The local statistical position is, however, presumably weaker and a nowise insignificant factor.

Copper.—Exports have been quite liberal, and doubtless as large as could be expected in view of more or less scarcity of ocean tonnage for the present and next two or three months. Home deliveries, to all accounts, were of merely fair proportions, and nothing in the way of lively buying interest is manifested at present. Prices are held quite firmly, however. In a retail way sales were of very moderate proportions, while dealers' prices for small lots remain unchanged at about 12¼c. per lb. for Lake Ingot and 11¼c. for Ansonia Grade Casting Copper.

Sheet Copper.—There is nothing new to report in this market. The demand, as is usual at the close of the year, is confined to small orders for immediate use. Consumers and dealers are stock taking, and the holiday week is not favorable to new business. A much better demand is looked for after the beginning of the new year, and the manufacturers are in good shape to meet it. Prices show no quotable change, but are fairly firm. Jobbers quote Sheet Copper at about 15c. per lb., basis.

Pig Lead.—Scarcely anything has been done outside of commonplace business in small lots, and the market remains in somewhat uncertain shape, with indications that large consumers are not only placing orders very conservatively but sparing no effort in the direction of helping along any real or fancied weakness. The retail trade has been equally quiet with the wholesale, there being quite a lull in dealers' business just now. Jobbers' prices for American Pig are about 4⅛c. to 4¼c. per lb. for small quantities.

Spelter.—The market for this metal remains in a dull and rather weak condition. Not only are sales moderate, but the demand is slow, and some difficulty has been experienced with local "official" efforts to belittle the importance of the present heavy production. The only sales made are of small lots for current use. Retail prices for good Western brands in moderate sized lots continue to be quoted at 4.45c. to 4½c. per lb.

Sheet Zinc.—There are no features of interest in connection with this material. The demand has been slack, and prices display no variation. Jobbers quote 600-lb. cask lots at 5⅝c. to 5¾c. per lb., and smaller quantities at 6⅛c. to 6¼c.

Antimony.—The market has been slow, and prices are rather easier at about 7¼c. for Japanese, 7½c. for Hallett's and 8½c. for Cookson's in small parcels.

Aluminum.—A fairly large demand continues for this metal. Prices are as follows: No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb.; 100-lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb.; 100-lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb.; 100-lb. lots, 30c.

Tin Plate.—For the last week of the year the volume of business in American plates has been fairly large. Orders for Cokes were placed to some amount for delivery over the first quarter of next year, but the dealings were invariably at low prices and the market closed in a somewhat weakish condition. A meeting of the Tin Plate makers was held this week at Columbus, Ohio, which, it is thought, may result in some sort of agreement whereby prices should be placed on a more satisfactory footing. As stocks of all kinds of Tin Plate are light and the mills are fairly well booked with orders ahead, there seems no valid reason why prices should be as weak as they are just now. The small retail business was of the lightest character, as is natural in the closing week of the year. Jobbers' prices on American Plates are nominally unchanged at about the following for moderate sized lots for spot delivery at New York, Philadelphia or Baltimore: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, 1C, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates remain very quiet and values are largely nominal in the absence of any material addition to stocks in importers' hands.

Sheet Iron.—A fairly liberal demand continues for both Black and Galvanized Sheets from mill. The mills are all busy on orders and makers look for a large tonnage next year. For this reason they are adhering strictly to quotations. Very little beyond a peddling business is being done in Sheets by the jobbers. Small lots from stock are firm at about 2.35c. to 2.40c. for No. 27 Common Black Sheets, and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: Both buyers and sellers are talking higher prices. Buyers are asking for quotations on long deliveries, but sellers are disposed to shorten the time and consequently both parties are slow to close. Small lots from stock are held at 2.20c. to 2.25c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—The market has been very dull. Consumers and exporters are alike holding off. Prices, while unchanged, are rather inclined to weakness. Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¾c.
Light Brass	per lb. 4¾c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3¼c.
Zinc	per lb. 2¾c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10.50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton	5.25
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	4.50

THE IRON MARKET.

Considering the season, an unusually large amount of business has been done during the week under review both in the cruder forms and in finished material. There has been quite a good deal of covering requirements of raw materials for the first three to six months of the coming year.

In Foundry Iron some large melters in the Philadelphia district have purchased quite heavily, one Pipe concern taking between 20,000 and 25,000 tons of Pig Iron, dividing the order between Eastern Pennsylvania, Virginia and Alabama furnaces. In Cincinnati, the leading market for Southern Iron, there has been a heavy run of inquiries, brought out, evidently, by the changed attitude of the selling interests.

The Billet market has been quiet, but on the other hand there have been sold very large quantities of Tin Plate and Sheet Bars, the tonnage running up to 40,000 tons. In the Chicago district, too, some larger sales of this character have been made.

Pig Iron.—The New York market has been quiet, with a fair run of moderate orders. In New England there has been a little more activity. The large buyers in the metropolitan district are pretty well covered for some time to come and are indifferent. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No 1, $10.75 to $11.25; No. 2, $10.25 to $10.75; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

At the moment the market for Pig Iron in Philadelphia is drifting around in such an indefinite way that it is almost impossible to say what are really and absolutely rock bottom prices. To offset the advance in freights recent quotations ought to be advanced, but in view of the low figures accepted in recent transactions it is probable that quotations will be unchanged at the old figures, which so far as sellers are concerned is a decline of 15c. to 25c. per ton. Seaboard quotations therefore

remain as follows, subject to the usual freight differences at points within 100 miles south or west : No. 1 X Foundry, $12 to $12.25 ; No. 2 X Foundry, $11.25 to $11.50; No. 2 Plain, $10.75 to $11.

More inquiries appeared in the Chicago Pig Iron market this week than for a considerable time. Some contracts were placed, but more were deferred until after the New Year. The sales made cover both Foundry and Malleable Irons. The local producers secured the bulk of the business, but some fair sized sales were made by Southern agents. Prices on Southern Irons are a little lower on some brands, but the leading companies continue to quote full prices. It is expected that the cheap sellers will very speedily be able to dispose of all the Iron they wish to sell at low rates. Business in Lake Superior Charcoal has been light. We quote for cash as follows:

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.00 to 11.50
Southern Coke, No. 1	10.75 to 11.25
Southern Coke, No. 2	10.35 to 11.00
Southern Coke, No. 3	10.10 to 10.60
Southern, No. 1 Soft	10.75 to 11.25
Southern, No. 2 Soft	10.35 to 11.00
Foundry Forge	9.85 to 10.10

The Pig Iron market in the Pittsburgh district has been fairly active, some good sized lots of Bessemer having been sold for the first three and four months of the year. In view of the large production of Bessemer Pig, and the fact that maximum consumption has about been reached, it does not seem that there can be much improvement in prices early in the year at least. We quote, f.o.b. Pittsburgh: No. 1 Foundry, $10.50 to $10.75; No. 2, $10 to $10.25; Bessemer, $10 to $10.15.

CHICAGO REPORT.

Scrap.—The situation shows no change. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$6.75	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9¼c.
Red Brass	....	8 c.
Yellow Brass	....	6¾c.
Light Brass	....	4½c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—Not much business is doing and prices are still weak. The card on carload lots of 12 tons minimum is as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8.60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

Comparatively little effort is being made to sell goods, either by manufacturers or wholesale merchants, who are content to take care of such orders as come along of their own accord, travelers being nearly all at home and the volume of business at a minimum. Attention is directed especially to the questions connected with the closing of the year's trade, taking stock, balancing books, &c. The changes which are taking place in business methods and the new problems which confront the trade, together with the too familiar matters of increasing costs and narrowing profits, afford subject for serious thought on the part of those who recognize the necessity of conforming their methods to changing conditions and avoid being left behind on account of failure to fall in with the movement of trade. Similar questions, assuming naturally a somewhat different form, present themselves to the retail merchant, and in connection with the taking of the annual inventory and ascertaining the results of the year's business it will be the part of wisdom for them to carefully consider their business methods and judge of the wisdom of such changes or new departures as they have made and the advisability of further enterprise in maintaining and extending trade. For merchants of all classes the prices at which they sell are as important as those at which they buy, and it will doubtless be admitted by many Hardware merchants, both wholesale and retail, that too little attention has been given to making reasonable profits on their goods. How to do this in view of existing competition is one of the great questions which should have careful consideration. Notwithstanding the fact that we are in the midst of the holiday season, when business is limited for the most part to the sale of such goods as are immediately required, there continues to be a fair movement of trade. In some heavy lines the condition of the market induces liberal purchases, and in general Hardware the demand is unusually good considering the time of year. Prices show but little general change. Wire and Wire products are firm. The Screw market is evidently in an improved condition and higher prices are announced. The general feeling is that there will be next season a large volume of business and more satisfactory conditions. We trust that these anticipations may be realized and that in the resulting prosperity our readers may have a full share.

Advices from Chicago.—The Shelf Hardware trade is still unusually active for December, but shows some falling off as compared with the early part of the month. Traveling men are now in for the holidays, and business is almost entirely confined to mail orders from customers who cannot wait for salesmen's visits. The demand for Tinware and House Furnishing Goods, Metals, &c., is quiet. Heavy Hardware jobbers report the usual quiet condition of trade found at the holiday season. Their customers are for the most part engaged in taking stock, but renewed buying is expected immediately after the opening of the new year.

NOTES ON PRICES.

Wire Nails.—The same general conditions which have prevailed for several weeks still characterize the Wire Nail market, the principal change being in the tendency toward somewhat higher prices. The trade are buying pretty freely, but most of them have covered their immediate requirements, and manufacturers are refraining from accepting orders except for prompt delivery. They evidently desire to be in a position to avail themselves of any advance in prices that may occur. While there are no new developments in regard to the efforts making for a consolidation of Wire Rod interests, the market is affected by the fact that negotiations are being conducted with this end in view, and while it is acknowledged that there is uncertainty as to the final outcome the probability of a successful consummation is conceded.

Advices from Chicago.—Manufacturers have had a good trade, and are receiving inquiries for future delivery, but refuse to quote for anything except for immediate shipment. Jobbers have marked up their prices for small lots and quote $1.60.

Cut Nails.—The Cut Nail market is without important change, and as it is not stimulated by the probability of an early advance business is sluggish, purchases being limited to the immediate requirements of the trade These, as usual at this season, are comparatively small.

Advices from Chicago.—No change is seen in this branch of trade, small lots from stock being held at $1.45.

Barb Wire.—The Barb Wire market is affected by the Wire Rod negotiations and has a firm tone. The volume of business is fair, but manufacturers are unwilling to accept orders for future delivery.

Advices from Chicago.—Inquiries continue to come in

for Barb Wire and the outlook for business is very good indeed. Small lots from stock are selling at $1.65 for Painted and $1.95 for Galvanized.

Smooth Wire.—In sympathy with the condition of the Wire market generally Smooth Wire is decidedly firm, with a fair volume of business.

Market and Stone Wire.—Some of the manufacturers of Market and Stone Wire are withdrawing their extreme discounts and naming slightly higher prices. This is on account of the probability of an advance in the raw material.

Screws.—During the past week the Screw market has been steadily improving in tone, most of the manufacturers uniting in the adoption of discount 87½ and 10 per cent. as the price of Flat Head Iron Screws, instead of 90 per cent., which has been the general base. One or two companies deferred action to see whether or not the movement would be general, recognizing that unless the new prices were adopted by all the prominent manufacturers it would not be feasible to maintain them. At a meeting held to-day (Wednesday) united action, however, was taken, to which all the manufacturers are parties, adopting the following discounts, which go into effect immediately:

	Per cent.
Flat Head Iron	87½ and 10
" " Japanned	85
" " Brass	87½ and 10
" " Bronze Metal	85 and 10
Round and Oval Head Iron	85
" " " " Brass	85
" " " " Bronze Metal	85
Flat Head Iron Screws, Blued	5 per cent. added

The prices which have ruled during the past year have been exceedingly low, being, it is said, only about one-seventh of those of 25 years ago, and they are also lower than those prevailing in England. Notwithstanding this fact there has been comparatively little speculative buying, although it is understood that some of the manufacturers have booked a good many orders. The announcement of the advanced prices will be received with approval by the trade and should have a good effect on the market.

Glass.—The settlement of the wage question, the early starting of the factories and the prospect of new Glass reaching the market in the near future in sufficient quantities to supply demands has removed uncertainty and speculation from the minds of the trade. January 8 is the date set for the general resumption of the factories, two or three weeks after which new Glass may be expected to reach the market. The start will be four months later than the usual date of September 1, and although the manufacturing capacity will be larger than ever before in this country it is estimated that not more than 4,000,000 50-foot boxes of Glass can be turned out by June 30. This quantity of Glass it is expected will be consumed by the early part of next fall. The American Glass Company are reported as preparing a new Glass list, considerably higher than the present one, which will be subject to larger discounts. The frequent changing of the price-list of Glass misleads no one as to the net advance in each size, save a few small retailers who perhaps do not take the trouble to figure out the discounts. A reduction in discount would accomplish the same purpose as that of advancing the price, and yet preserve a list with which all have become familiar. Upon the recognition accorded the jobbers by the American Glass Company and the price at which American Glass is offered them will largely depend the amount of foreign Glass imported during the following months. American Glass continues to be quoted at 60 per cent. discount by jobbers and imported Glass at 80 and 10 per cent.

White Lead.—Business has proceeded in the usual way for the season and prices have remained stationary for both "combine" and outside brands.

Red Lead.—Orders to about the usual extent for the season are being placed for Red Lead at prices in line with those that have ruled for a considerable time past. Otherwise the market is without feature of interest, there being no disturbing or unusually enlivening influences at work. To all accounts, the orders thus far placed for 1898 delivery are fully up to the volume of those booked a year ago.

Spirits Turpentine.—Stronger advices from the South, along with quite good business here, have carried prices a fraction higher, and the market is now strong at 35 to 35½ cents for retail quantities.

The New York Commercial.—*The Shipping and Commercial List* announces that on the 25th it ceased as a weekly publication. It has been regularly published in New York for 102 years and one week. Beginning with January 3 the paper will be known as the *New York Commercial*, and it will appear daily, except on Sundays and holidays. As the direct descendant of the *New York Prices-Current*, which was established in 1795, the paper enjoys the distinction of being the oldest commercial paper in America. The new form will enable its management to give more forceful, by reason of more frequent, publicity to the great events of the day, as well as to continue the emphasis of the underlying principles of the original publication characterizing it during the past century.

The New York State Railway Commissioners have decided to extend the time for the equipment of freight cars on the railroads in the State with automatic couplers to December 31, 1899. This gives the railroads two additional years in which to comply with the law on the subject.

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Metal and Miscellaneous Prices.

CHICAGO, DECEMBER 30, 1897.

Tin—

Straits pigs.....15¼@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
IX, 14 x 56	21.00	$12.50
IXX, 14 x 56	24.00	14.00
IX, 14 x 60	23.00	13.50
IXX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	7.00
	IXX, 14 x 20	8.75
	IXXX, 14 x 20	10.50
	IXXXX, 14 x 20	12.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.75
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$4.00
	IC, 10 x 20	6.00
	IC, 17 x 17	8.50
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.50
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.75
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	$11.50@ 13.00
Worcester Grade, 12 to 14 lbs. coating	9.00@ 10.00
STP —— Grade, L 10 to 12 lbs. coating	8.00@ 9.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.80¢	2.50¢
17 to 20	1.90¢	2.60¢
21 to 24	2.00¢	2.70¢
25 and 26	2.10¢	2.80¢
27	2.20¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, lb, A	$10.20	10% dis.
Patent Planished, lb, B	9.20	
Craig's Polished Sheet Steel		8½¢
U.S. Polished Sheet Steel No. 27 A		5.45¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch.....36
Plain, ½ inch up to ⅝ inch.....38
Plain, ⅜ inch up to ½ inch.....41
Plain, 5-16 inch up to ⅜ inch.....08
Plain, ¼ inch up to 5-16 inch.....65
Plain, 3-16 inch up to ¼ inch.....1.00
Plain, ⅛ inch up to 3-16 inch.....1.50
Plain, 2 inch up to 3 inch.....38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots.....lb, 40¢
100-lb lots.....lb, 36¢
No. 2 (guaranteed over 90% pure).
Small lots.....lb, 34¢
100-lb lots.....lb, 33¢
Nickel Aluminum Casting Metal.
Small lots.....lb, 39¢
100-lb lots.....lb, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....lb, 35¢
100-lb lots.....lb 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....lb, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter.....lb, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 lb or more. Less quantities, 5¢ lb additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	lb	lb	lb
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4¼@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax.....2.20 square
The Lloyd Spanish Tiling.....4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. lb square,	$4.75	$4.50
Galv. lb square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20.....8.00 square
Steel Painted, 14 x 20.....7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14.....5.50 square
7 x 10.....6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10.....8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....lb 2 ¢
" " Brown.....lb 1½¢
" " Purple.....lb 2½¢
" " Ground in oil, B. Red, lb 6½¢
" " Ground in oil, Red...lb 6½¢
" " Ground in oil, Brown, lb 5½¢
" " Ground in oil, Purple, lb 6½¢
Linseed Oil, Boiled, in bbls.....40¢
Linseed Oil, Raw, in bbls.....38¢
Mineral Paints.....1 @ 3¢
Orange Mineral.....12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs 3 to 6 ¢
Sipe's Japan Oil, in bbls., lb gal..... .34¢
Spirits Turpentine, in bbls., lb gal..35½¢
Asphaltum, Trinidad Refined, lb ton.$45
Tarred Felt, 1 Ply, lb 100 lb.....$1.25
Tarred Felt, 2 Ply, lb roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, lb roll 108 sq. feet.....$1.25
Roofing Pitch, lb bbl of 300 lb.....$3.00

NEW YORK, DECEMBER 31.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₩ lb, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.56	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 8½@8¾¢
Hallett's.....₩ lb, 7¾@8¢
Japanese .....₩ lb, 7½¢

Brass—Planished.....net

Roll and Sheet .....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¾-in. up to 2-in.....	$0.35
⅝-in. up to ¾-in.....	.36
½-in. up to ⅝-in.....	.38
⅜-in. up to ½-in.....	.41
5-16-in. up to ⅜-in.....	.48
¼-in. up to 5-16-in.....	.65
3-10-in. up to ¼-in.....	1.00
⅛-in. up to 3-16-in.....	1.50
Smaller than ⅛-in.....	Special
3-in. and larger.....	Special
2-in. to 3-in., to No. 19, inclusive.	.38

35% off.

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ lb 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....85%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....85%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₩ lb, 2.00....	2.30¢
Nos. 17 to 21.....	₩ lb, 2.10....	2.40¢
Nos. 22 to 24.....	₩ lb, 2.20....	2.50¢
Nos. 25 and 26...	₩ lb, 2.30....	2.60¢
No. 27	₩ lb, 2.40....	2.70¢
No. 28	₩ lb, 2.50....	2.80¢
American B. B.....	₩ lb, 4¢	

Russia, Planished, &c.
Genuine Russia, according to assortment.....₩ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ lb, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

Nos. 10 to 16.....	₩ lb, 12¢	75&10& 5% off.
Nos. 17 to 21.	₩ lb, 13¢	
Nos. 22 to 24.....	₩ lb, 14¢	
Nos. 25 to 26.....	₩ lb, 15¢	
No. 27.....	₩ lb, 16¢	
No. 28.....	₩ lb, 17¢	
No. 29.....	₩ lb, 19¢	
No. 30.....	₩ lb, 21¢	

36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig .....4⅛@4¼¢
Bar.....5¢
Pipe.....5¾¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6¾¢. 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb.....5¾@6¢
Lead. Amn. White, in oil.....5¾@6¢
Lead, Red. bbls. and ½ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American..... @1½¢
Red Venetian, American..... @1¾¢
Linseed Oil:
Raw, ₩ gal.....43@44¢
Boiled.....45@46¢
Spirits Turpentine:
In bbls.....35@35½¢
In cases.....43@43½¢
Putty:
In barrels and ½ bbls..... 1¾@2¢
In tubs.....1¾@2¢
In tin cans..... 2½@3¢
In bladders .....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5 ¢
Clarified.....₩ lb 4⅞¢
Accra.....₩ lb 4¾¢
Half Jack.....₩ lb 4½¢
Cecilia.....₩ 100 lb $4.85
Choice Red.....₩ 100 lb 4.60
(*Spot Oil*, ½c. ₩ lb *higher.*)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline.....	₩ gal. 10@11¢
Kerosene.....	₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin 60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.
Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897..... 40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons..... 70%
Galvanized Iron Range Boilers above 52 gallon.....70%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....65%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized 50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.
Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock. ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₩ bbl.	$1.47@$1.48
Rosin, E. & F.....	₩ bbl.	1.52@ 1.60
Rosin, G. & H.....	₩ bbl.	1.65@ 1.70
Rosin, I. & K	₩ bbl.	1.80@ 1.90
Rosin, M. & N.....	₩ bbl.	2.10@ 2.45

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₩ sqr.	$3.75@$5.00
No. 1 Bangor Ribbon.....	3.35@ 3.75
Pen Argyle, ₩ sqr.....	3.75@ 4.35
Peach Bottom, ₩ sqr.....	4.75@ 5.60
No. 1 Chapman, ₩ sqr....	3.80@ 4.80
Lehigh Slates, ₩ sqr... ..	3.00@ 4.50

Vermont:

Sea Green, ₩ sqr.....	$2.50@$3.55
Purple, ₩ sqr.....	3.25@ 4.00
Unfading Green, ₩ sqr...	3.75@ 4.50
Red, ₩ sqr.....	9.00@11.00

Solder and Soldering Fluids— Solder—

½&½ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb..... .....4¢
5% dis.

Yager's Soldering Salts.
½ lb bottles, each.....30¢
Large quantities, ₩ lb.....40¢

Soldering Coppers—

Per lb.....15½¢@17½¢ net

Spelter—

Western Spelter..... 4.45@4½¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized..... .....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15½¢
Straits, pigs, lb lb..... 14¾¢
Straits, in bars, ₩ lb.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20....	6.75
" "	IXXX,	14 x 20....	7.75
" "	IXXXX,	14 x 20....	8.75
" "	DC,	12½ x 17....	4.25
" "	DX,	12½ x 17....	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20...	5.75
" "	IXXX,	14 x 20...	6.50
" "	IXXXX,	14 x 20...	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:
100 lb.....10¢
95 lb.....15
90 lb.....20¢
85 lb.....25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating.....	8.00 @ 9.25
STP Grade, 10 to 12 lb coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke,	IC, 14 x 20.....	$4.25
	IX, 14 x 20.....	5.25

Terne Plates—

MF, IC, 14 x 20.....	$6.25
20 x 28.....	12.50
Worcester Grade, IC, 14 x 20.....	4.25
20 x 28.....	8.50
Dean Grade, IC, 14 x 20.....	4.00
20 x 28.....	8.00
Gilbertson's Old Method, IC, 14 x 20..	7.50
20 x 28..	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing -

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.
1¼ and less, Plain 72%
1¼ and less, Galv..... 67%
1½ and larger, Plain..... 78%
1½ and larger, Galv..... 70%
Screw and Socket Joint Casing.....65%
Inserted Joint Casing.....60%
Boiler Tubes, 2¼ inch and smaller.72½%
" 2½ inch and larger 75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

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Lalance & Grosjean Mfg. Co., 19 Cliff St.. N. Y.

Agricultural Furnaces.
Wheeler, Russel & Son. Utica. N. Y.

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Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
Willis Mfg. Co., Galesburg, Ill.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.
Dover Stamping Co., Boston, Mass.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Beer Pumps.
I. X. L, Beer Pump Co., Phila., Pa.

Books.
Tower, F. W., Springfield, Mass.

Bronze and Bronzing Liquid.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
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Crosby, G. A. & Co., Chicago, Ill.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.

Conductor Pipe Machinery.
Poorman Mfg. Co., Piqua, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

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Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Crimping Machines.
Packham Crimper Co., Mechanicsburg, Ohio.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.

Dampers.
Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.
Oster Mfg. Co., Cleveland, Ohio.

Dinner Pails.
Kleckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

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Berger Mfg. Co., Canton, O.

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Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Conn.

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Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

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Blodgett, G. S. Co., Burlington, Vt.

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Wheeler, Russel & Son, Utica, N. Y.

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Presbrey Stove Lining Co., Taunton, Mass.
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Troy Nickel Works, Troy, N. Y.

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Connors, William, Troy, N. Y.

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Carton Furnace Co., Utica, N. Y.
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Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
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Carton Furnace Co., Utica, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Graff & Co., 208 Water St., N. Y.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Hart & Crouse Co., Utica, N. Y.
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Kernan Furnace Co., Utica, N. Y.
Pease, J. F., F'ce Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Ct.
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Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
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Burgess Soldering Furnace Co., Columbus, Ohio.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.
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Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Colt, J. B. & Co., 115 Nassau St., N. Y.
Kent, C. M. Mfg. Co., Baltimore, Md.

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St. Louis Stamping Co., St. Louis, Mo.

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Jackson, W. Sons, 246 Front St., N. Y.

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Whelan, Dennis. J., Troy, N. Y.

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Palmer, I. E., Middletown, Ct.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill.
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Drake, W. H., Newark, N. J.
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Huse, Jos. & Son, Boston, Mass.
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Miliar, C. & Son, Utica, N. Y.

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Monarch Refrigerator Works, Burlington, Vt.

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Highton, Wm. & Sons, Boston, Mass.
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Roofing Machines.
Dwight Slate Machine Co., Hartford, Ct.
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Salem Nail Co., 292 Pearl St., N. Y.

Roofing Seamers.
North Penn Iron Co., Phila., Pa.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
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Gait, John & Sons, 253 Broadway, N. Y.
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Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.
Mersick, C. S. & Co., New Haven, Conn.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
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Whelan, Dennis J., Troy, N Y.

Sheet Metal Work.

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Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
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Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
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McCullough Iron Co., Wilmington, Del.
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Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia Pa.

Sheets, Galvanized.

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

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Berger Mfg. Co., Canton, O.
Buruen, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Graff Roofing Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.
Thorn Shingle & Ornament Co., Philadelphia, Pa.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Sinks.

Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Skylights.

Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.

Gait, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.

Whelan, Dennis J., Troy, N. Y.

Snow Guards.

Halliday, M., East 9th St., N. Y.

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Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.

Burgess Soldering Furnace Co., Columbus, Ohio.

Speaking Tubes and Whistles.

Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties Sheet Metal.

Vogel, Wm. & Bros., Brooklyn, N. Y.

Statuary, Sheet Metal.

Mullins, W. H., Salem, O.

Steam and Gas Fitters' Supplies.

Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 18th St., N. Y.

Steel Stamps and Stencil Dies.

Schwerdtle & Siebert, Bridgeport, Ct.

Stove and Metal Polish.

Hoffman, Geo. W., Indianapolis, Ind.

Stove Linings.

McLeod & Henry Co., Troy, N. Y.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove Patterns.

Bascom, H. Clay & Co., Troy, N. Y.
Cincinnati Pattern Works, Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.

Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trucks.

Morsick, C. S. & Co., New Haven, Ct.

Stoves and Ranges.

Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Bussey & McLeod Stove Co., Troy, N.Y.
Eclipse Stove Co., Mansfield, O.
Graff & Co., 208 Water St., N. Y.
Hess, Snyder & Co., Massillon, O.
Howard Stove Co., Beaver Falls, Pa.
Magee Furnace Co., Boston, Mass.
Michigan Stove Co., Chicago, Ill.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Sheppard, Isaac A. & Co., Phila., Pa.
Thatcher Furnace Co., 240 Water St., New York.
Van, John, Range Co., Cincinnati, O.
Walker & Pratt Mfg. Co., Boston, Mass.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.

Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Dangler Stove & Mfg. Co., Cleveland, O.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Tea Kettles.

Central Stamping Co., 23 to 25 Cliff St., New York.
Hill-Whitney Aluminum Co., Boston, Mass.
Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

Tinners' Tools, Machines and Supplies.

Berger, L. D., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.

Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate. (*Mfrs. of.*)

Ætna-Standard Iron & Steel Co., Bridgeport, O
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Ellwood Tin Plate Co, Ellwood City, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phelps, Dodge & Co., 11 Cliff St., N. Y.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.

Central Stamping Co., 23 and 25 Cliff St., New York.
Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kieckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.

Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Valves.

Eastwood Wire Mfg. Co., Belleville, N. J.
Goodrich, Judson A. Co., 120 Beekman St., N. Y.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.

Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.

Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.

Littleford Bros., Cincinnati, O.
Marston, I. G. & Co., Boston, Mass.

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Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Kenney Sanitary Mfg. Co, 47 Dey St., N. Y.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.

Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.

Miner & Peck Mfg. Co., New Haven, Ct.

Zinc, Sheet.

Phelps, Dodge & Co., 11 Cliff St., N. Y.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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HELP WANTED.

An experienced SALESMAN who is thoroughly acquainted with the trade in New York City and vicinity. N. & G. Taylor Co., Philadelphia, Pa. Jan. 1

A man acquainted among architects and builders to solicit orders for roofing and cornice work. "A. & B.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

By a manufacturer to correspond with SALESMEN who are in a position to market an up to date line of boilers. "Market," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

To correspond with SALESMEN visiting the Western territory. "Territory," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

A WORKING FOREMAN in a furnace and ventilating shop in Brooklyn, N. Y.; must be a thorough mechanic; shop employs six bench hands; steady job; nine hours' work; wages $4; non-union shop. "A. Z.," office of *The Metal Worker*, 232-238 William street, New York City. Jan 1

By a tin plate and metal house SALESMAN acquainted with the trade in Middle and Western New York State, Western Pennsylvania and Northeastern Ohio; also one acquainted with the trade in the States on the Atlantic seaboard; none but those thoroughly acquainted need apply. "Metal," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

A first-class STOVE PATTERN MAKER. "A. B.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

SALESMAN traveling Northern Pennsylvania and New York to handle a line of conductor pipes, eaves troughs, &c., who is well acquainted with the hardware and stove trade. F. E. Smith, 35 Washington street, Buffalo, N. Y. Jan. 1

A SALESMAN of ability and connections in Eastern and Southern States to represent a well-known line of steel ranges on commission. "Steel Ranges," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 25

RETINNER; one who is practical in the latest improved way of retinning. P. O. Box 1778, New York City. Dec. 25

A first-class STOVE SALESMAN for Western and Southern New York; give experience and salary expected. "Stoves," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 25

A young man who has some knowledge of cornice cutting and drafting who wants to finish his trade in a good shop; state how long been at business and what wages wanted. "Cornice," office of *The Metal Worker*, 232-238 William street, New York City. Dec 18

SITUATIONS WANTED.

By a young man; seven years' experience at tin and sheet iron work; good pattern cutter; wages wanted, $9 a week. Chas. Carter, Rear No. 7, 230 North Front street, Philadelphia, Pa. Jan. 1

An experienced heating SUPERINTENDENT wants position with some city house or to represent out of town manufacturer in New York City; competent to plan, estimate and construct heating contracts in hot air, combination, steam and hot water; also has traveled trade contingent to New York City. "Contracts," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

Man, fairly good CUTTER and ESTIMATOR and practical mechanic in all branches of the cornice trade, would like to engage with some large firm where he can improve himself in the art of cutting and estimating; reasonable compensation; honest and faithful workman; 16 years' experience; capable of handling any amount of men, inside and outside. "Estimating," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

As SALESMAN with house handling steam boilers by young man, 26. "Hustler," P. O. Box 1570, New York City. Jan. 1

Steady job by a first-class PLUMBER in New York or some nearby city or town; strictly competent and reliable man, who understands furnace work and tin roofing; first-class references as to sobriety and character; nine years' experience; call or address. Thos. Walsh, 669 Third avenue, New York City. Jan. 1

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By a TINSMITH of five years' experience; roofing, gutter, pump and general jobbing; have some knowledge of furnace work; well acquainted with hardware; sober and steady; reasonable wages: Illinois preferred. General Delivery, Canton, Ill. Jan. 1

PLUMBER, young man, married, good workman, understanding sanitary work thoroughly, also steam and water fitting, can estimate work from plans, wishes a steady position in a growing town or city near New York; will work to employer's interest and guarantee satisfaction. Address, stating wages, which must be fair, "J. W. B.," Red Bank, N. J. Jan. 1

By a TIN and SHEET IRON WORKER and general jobber; city or country; accustomed to gutters, leaders, heater and range work; eight years' experience; strictly sober; single man; can furnish good references if required. Henry A. Wolfson, 73 East 106th street, New York City. Jan. 1

By a practical cornice man as SUPERINTENDENT or FOREMAN; has had large experience; capable of filling all requirements pertaining to that business; would like to correspond with parties now in the business or who contemplate going into it; best of references. "Enterprise," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 1

Young man, age 21, who has had one year's experience at plumbing, desires to finish trade in a good plumbing shop; references if wanted. F. S. Warren, Box 38, Woodfords, Maine. Jan. 1

As TRAVELING SALESMAN for 1898 with a stove, heater and range house; many years' experience. "H. B. H.," 311 Cherry street, Philadelphia, Pa. Jan. 1

By a young man as FOREMAN or CUTTER in a cornice and skylight shop. G. Fisher, 186 East Houston street, New York City. Jan. 1

A young man, with several years' experience in the stove business, desires a position in either a wholesale or retail establishment; understands the repair business; references of the very best. "Repairs," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

By a PLUMBER and TINNER; good at iron pipe work and general jobbing; 12 years' experience; sober and steady; will work cheap for steady work. "John," 52 Hill street, Bloomfield, N. J. Jan. 1

By a TINSMITH with six years' experience in both city and country shop; single; sober and reliable; able to cut patterns for all ordinary cornice and sheet metal work; would like steady position in a good country shop. John S. Nelson, 56 Hamilton avenue, Passaic, N. J. Jan. 1

An experienced man in the gas or coal stove business; for many years with the best manufacturers in this country; capable of filling any position, from salesman on the road to manager of manufacture or distribution; highest recommendations can be furnished. "Gas Stoves," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 1

As ESTIMATOR and FOREMAN of a metal, cornice, skylight and jobbing shop. "Foreman," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Jan. 1

By a young man as TINSMITH; ten years' experience at general jobbing and roofing. Fred. Waxman, 1496 First avenue, New York City. Jan. 1

A CUTTER and all around cornice worker. "X. Y. Z.," 404 Lippencott Building, Philadelphia, Pa. Jan. 1

By a first-class WOOD PATTERN MAKER who can do designing, carving, tinning and all wood work in stove trade; 13 years' experience; 24 years of age; wages $3 per day; can show work done. Geo. Guenther, 66 Bertram street, Cleveland, Ohio. Jan. 1

By an all around TINSMITH and general bicycle repair man; also an experienced brazier; especially good on job work of all kind; best of references furnished from former employers. I. N. Jones, 840 Francis street, Defiance, Ohio. Jan. 1

Steady work by a TINSMITH and PLUMBER; city or country. Harry Rosenbloom, 152 East Broadway, New York City. Jan. 1

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As TRAVELING SALESMAN by a man with 12 years' experience in retail stove and tin business and six months on the road. J. W. Hackney, 815 W. Chestnut street, Louisville, Ky. Jan. 1

SALESMAN of 12 years' experience would like situation with manufacturer or large hardware house, either on the road or house position; have had experience as manager; can give best references; would like to make change early in January. "Experience," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 1

Cornice cutter, skylight maker, tinner and tin roofer desires a position as FOREMAN or at the bench; can give references. Joseph P. Coleman, 706 West Chicago avenue, Chicago, Ill. Jan. 1

TINSMITH; proficient job or assortment workman; 45 years of age; non-union workman; best of reference; city or country; wages reasonable. "Francis," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

A bright, energetic man, who understands furnace, cornice and all kinds of sheet metal pipe and stove work, is capable of cutting and can detail work from plans, would like a steady position with some reliable firm for the year 1898 in a good town or city; do not answer unless you are in need of a good, steady and reliable workman; am single; can speak German, and have the best of references; wages moderate. "F. A. H.," office of *The Metal Worker*, 512 Commercial Building, St. Louis, Mo. Dec. 25

By a DESIGNER and MODELER for stove ornaments. "W. G.," office of *The Metal Worker*, 232-238 William street, New York City. Dec. 25

A SALESMAN calling on the hardware, drug and grocery jobbing trade with a line of oil cans in Eastern Pennsylvania, New Jersey, Eastern New York and the New England States, desires a line that can be worked in connection with the oil can. 404 Lippencott Building, Philadelphia, Pa. Dec. 25

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I wish to secure after January 1 the agency for New Orleans and vicinity of a large and reliable wholesale house; I am well known to the trade here through my present connections and can assure a thorough introduction of the products of any firm I may represent; correspondence solicited; references given. Frank Paul Barber, 530 Gravier street, New Orleans, La. Dec. 25

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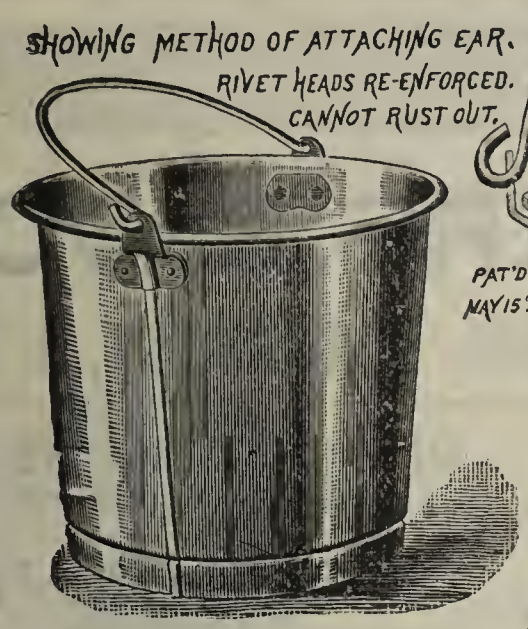
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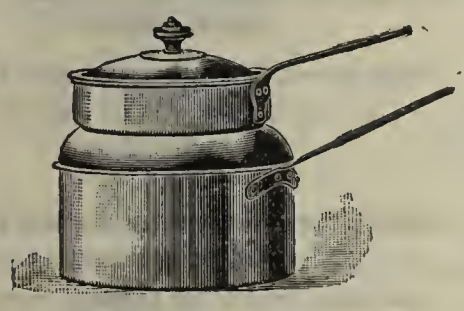








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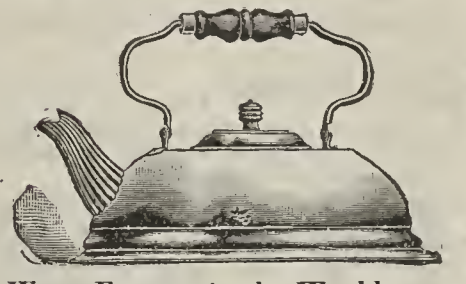
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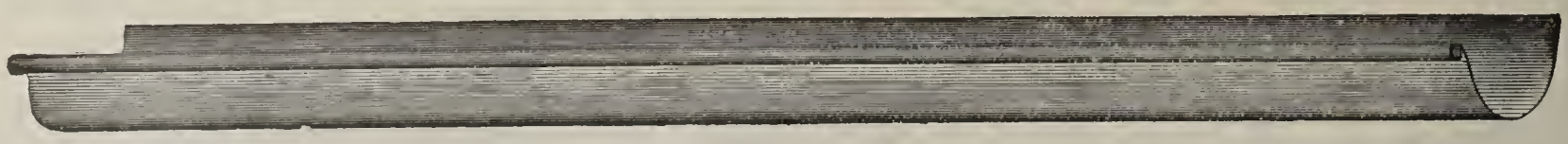
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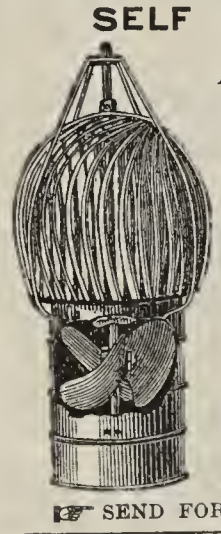
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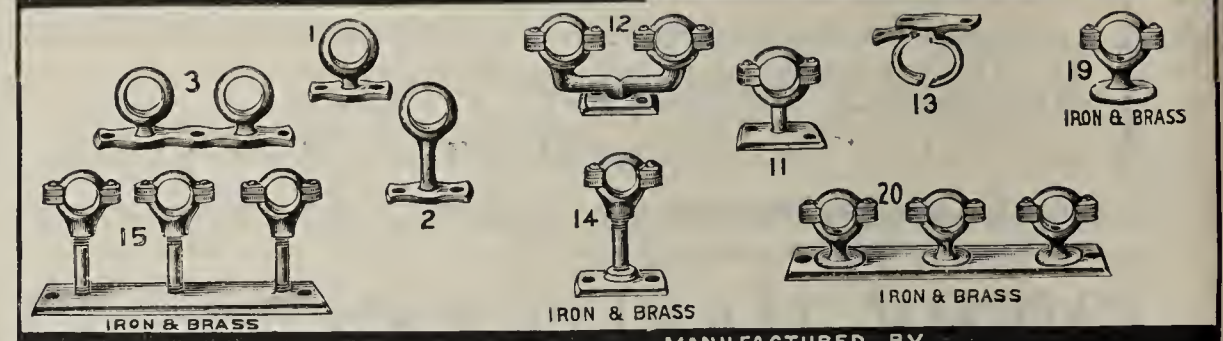
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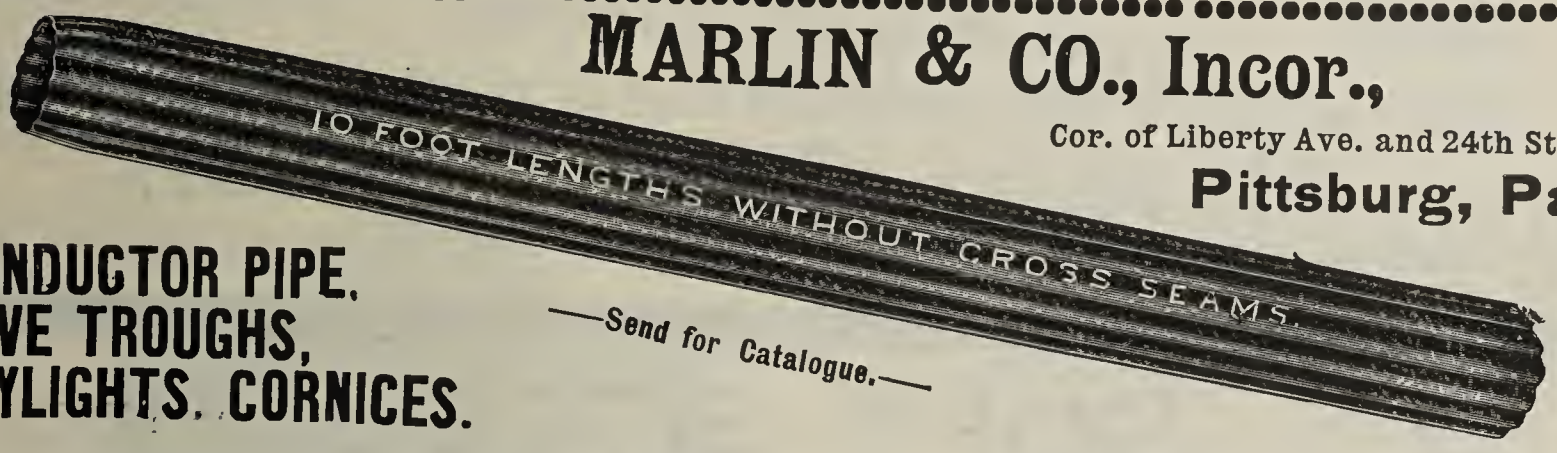
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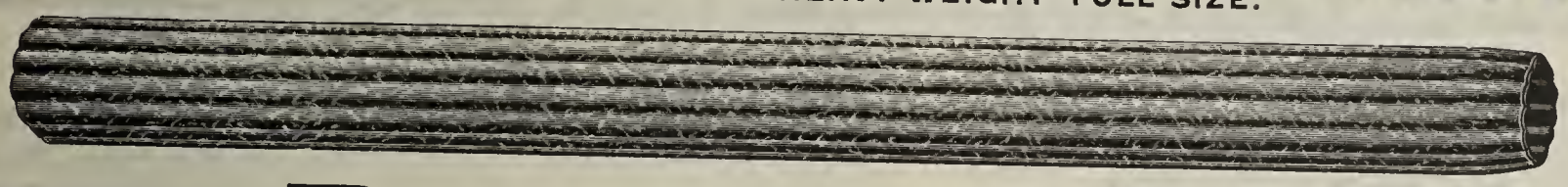
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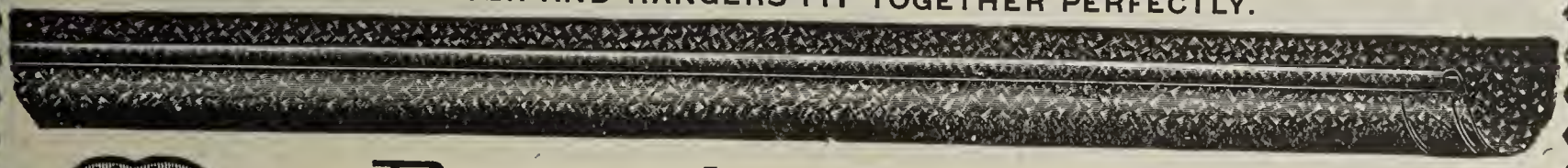
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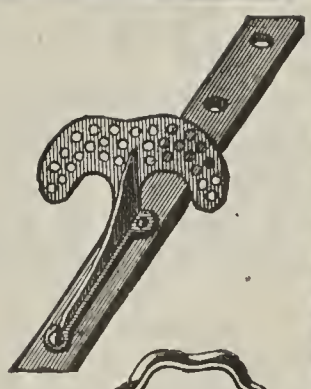
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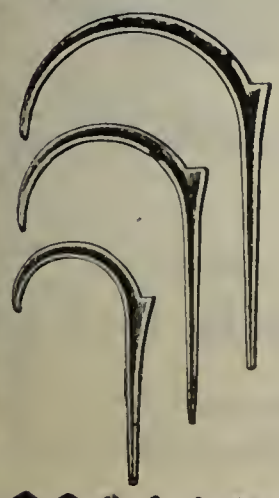




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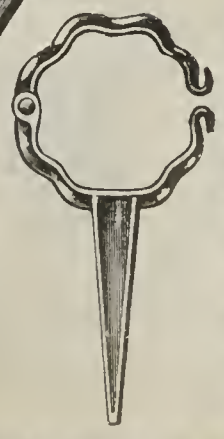
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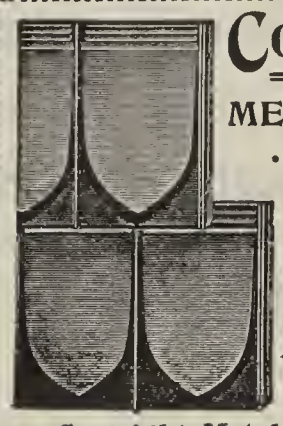
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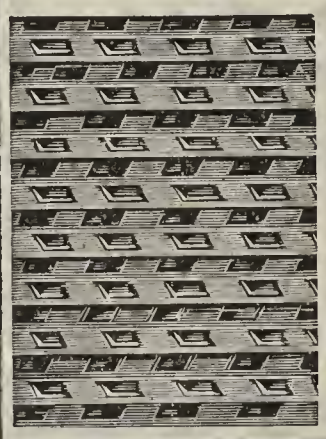
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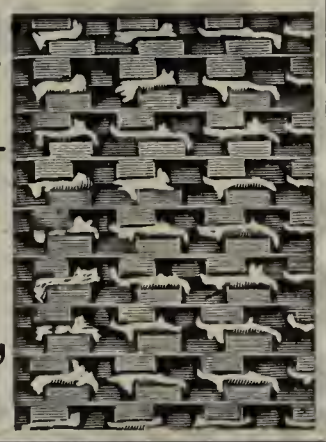
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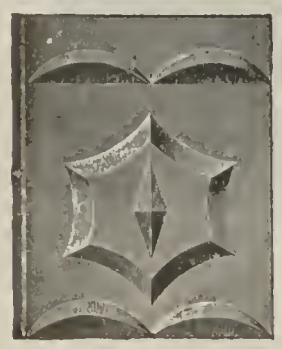
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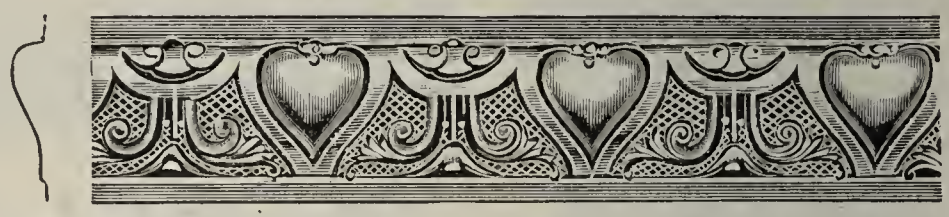


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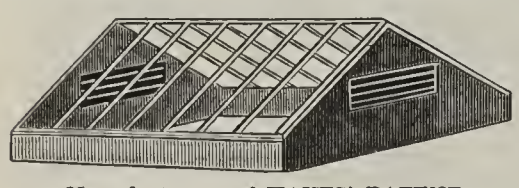
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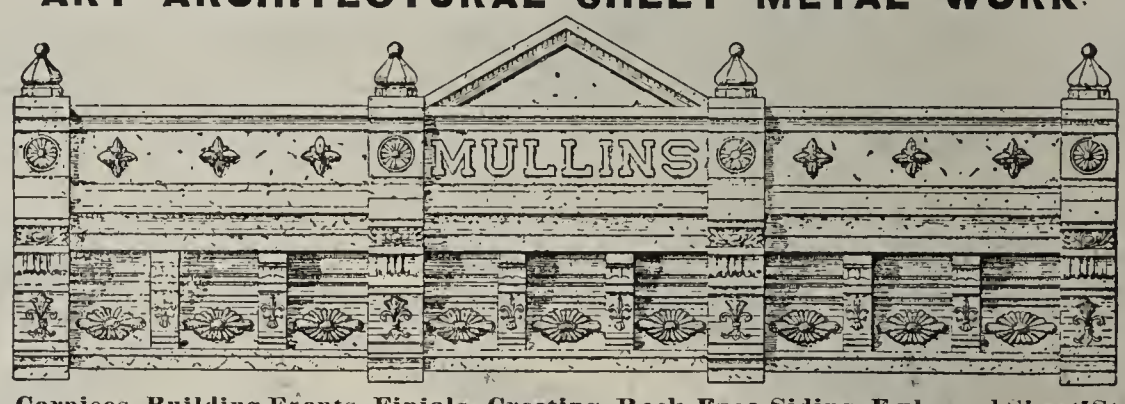
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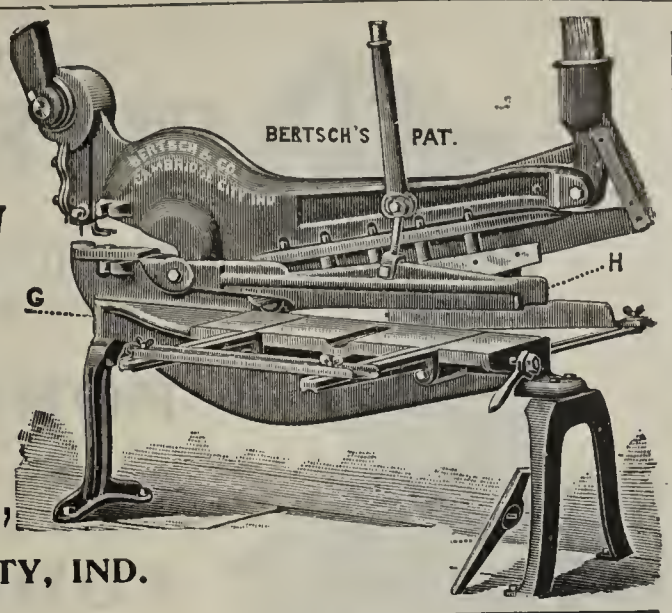
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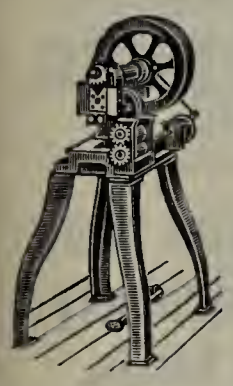
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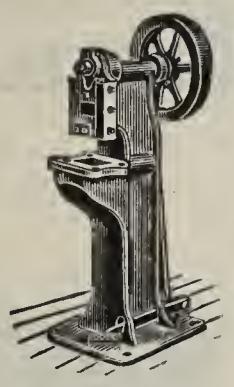
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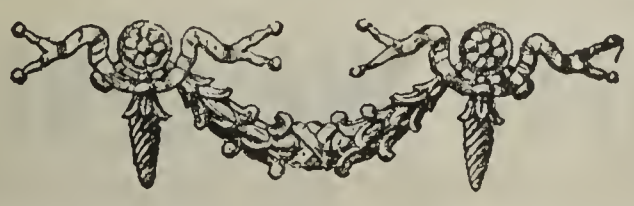
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"Oh, it's simple," replied the Congressman. "You address him as 'Mr. President,' and then add anything pleasant and timely that may occur to you. He won't be able to give us but a few minutes, you know."

"I see he has taken to horseback riding. How would it do to mention that, and then refer to our own stock and express the hope that he may have a good mount?"

"No!" exclaimed the Congressman. "Whatever you do, don't talk horse; be easy and natural, but not conventional."

The man was presented to the President, when, to his great surprise, the President himself began to talk horse. But the Kentuckian, obeying his Congressman's tip, said next to nothing in reply on that subject.

A few days afterward the Congressman called alone at the White House, and the President said to him:

"What sort of Kentuckian was that you brought here the other day?"

"A tiptop one, sir." Why?"

"Why, I tried to talk horse to him, and he didn't seem to know anything about horses."

The Congressman was strongly tempted to tell the whole story, but as the joke was really on himself he kept his peace. But he is trying extra hard to get the man a place as a salve for his own conscience.—*Exchange.*

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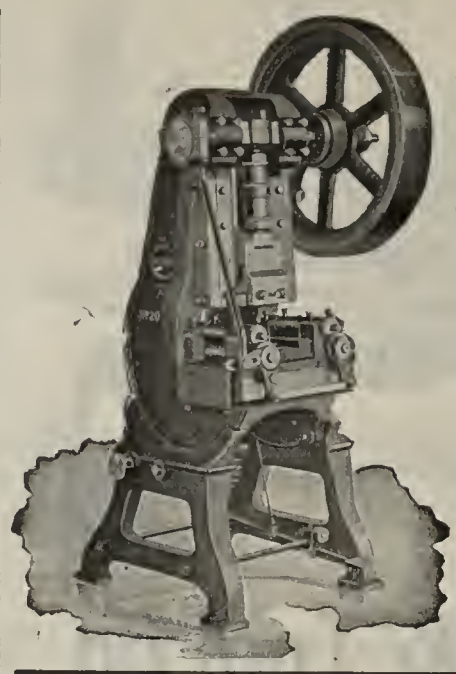
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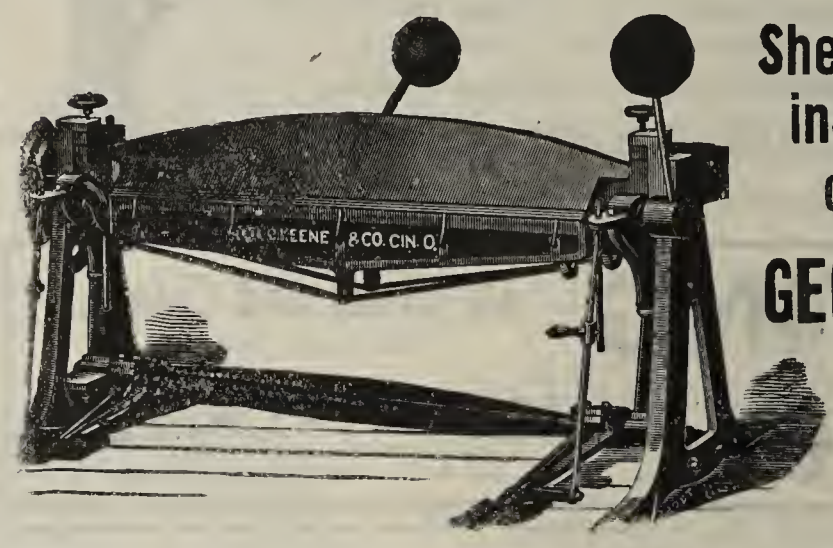
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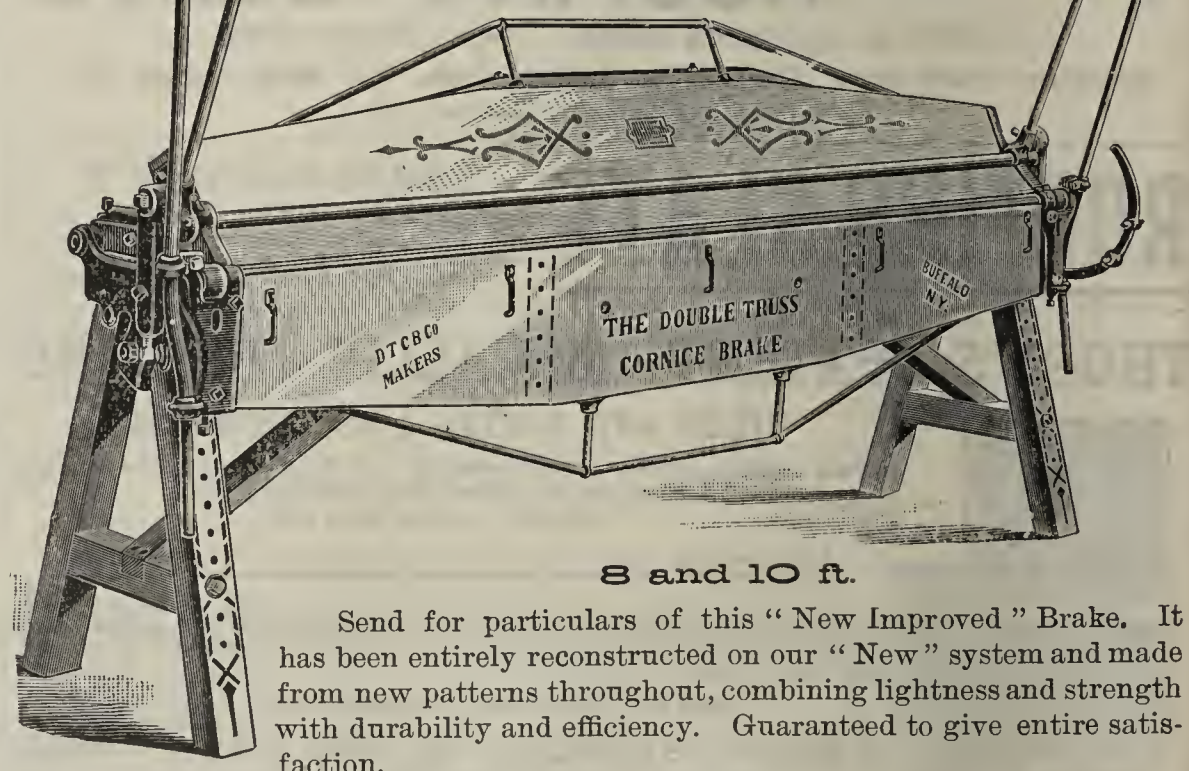
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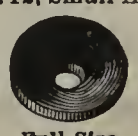


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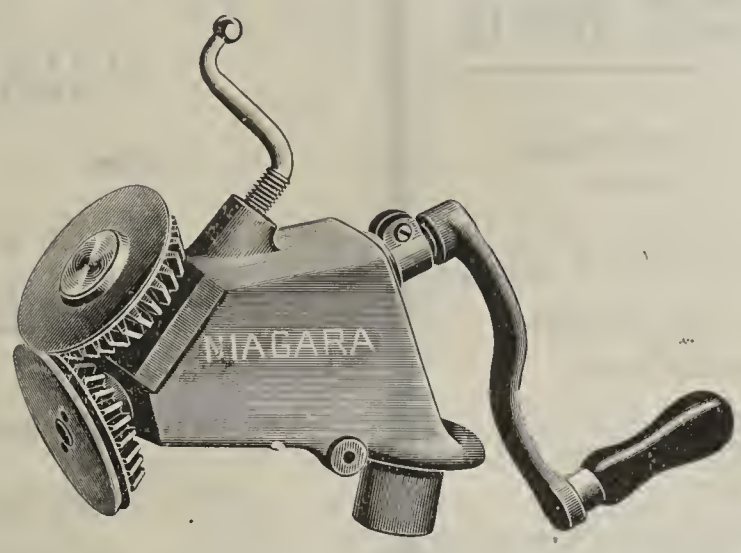
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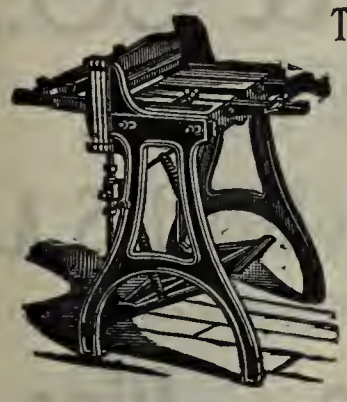
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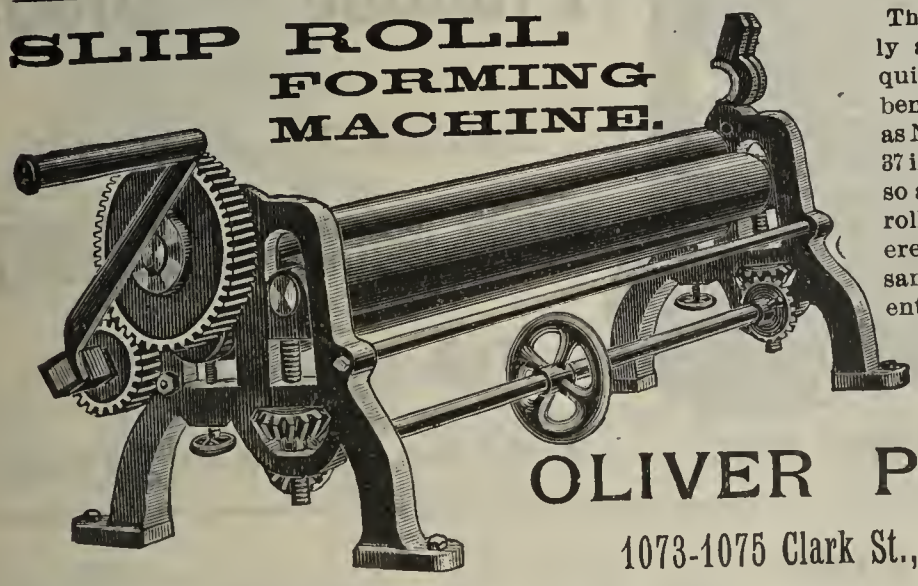
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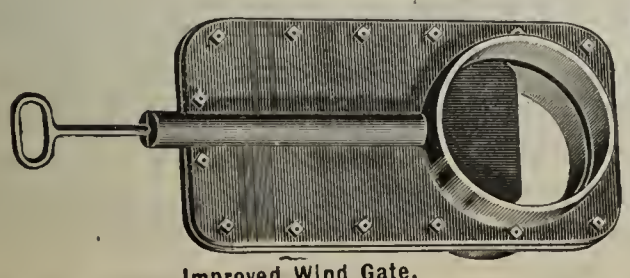
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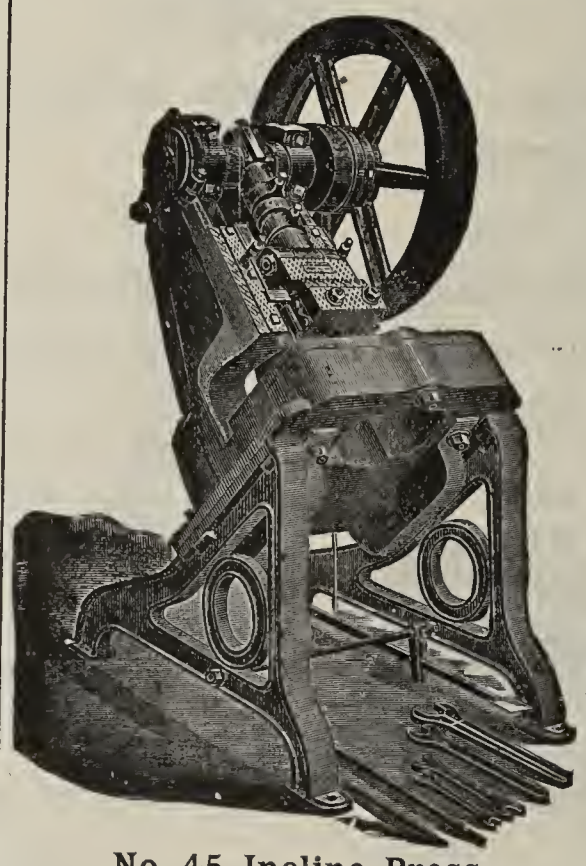
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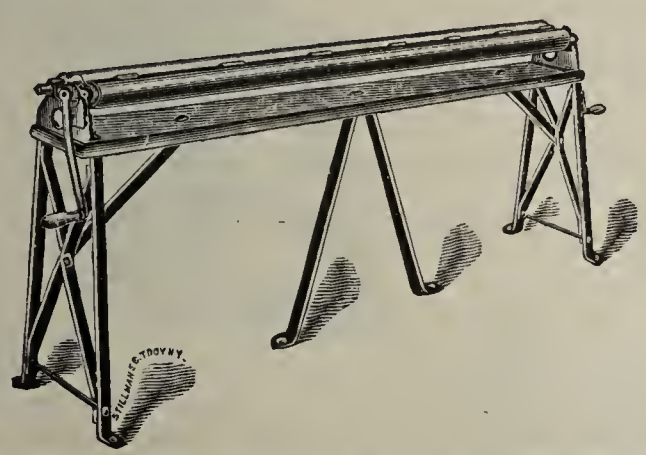
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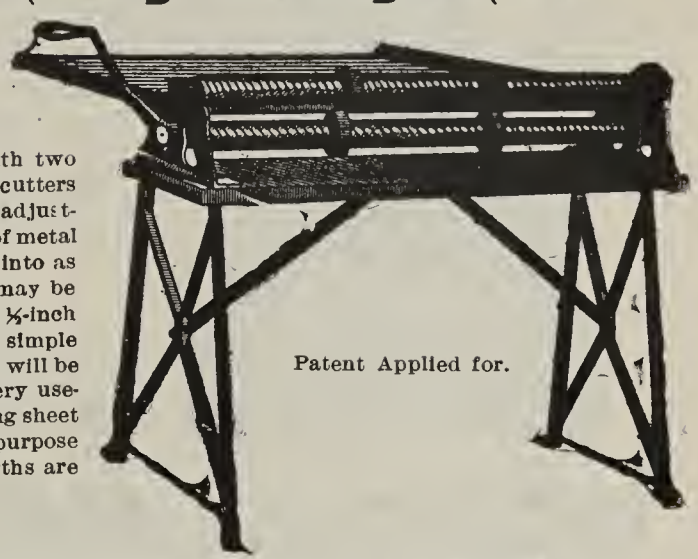
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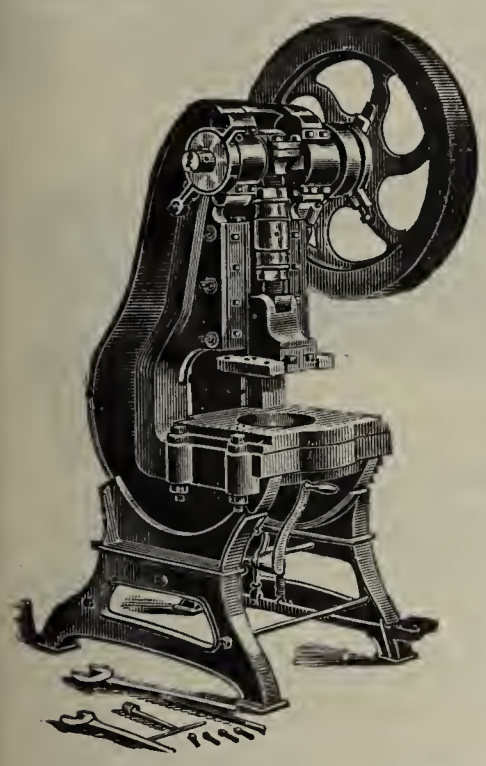


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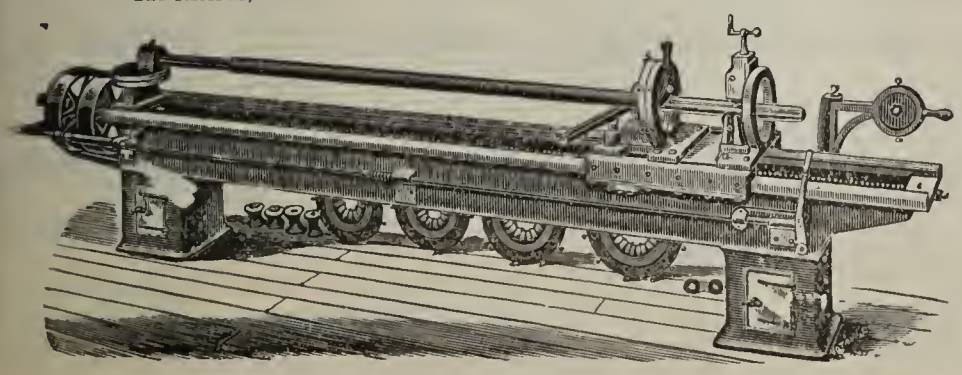
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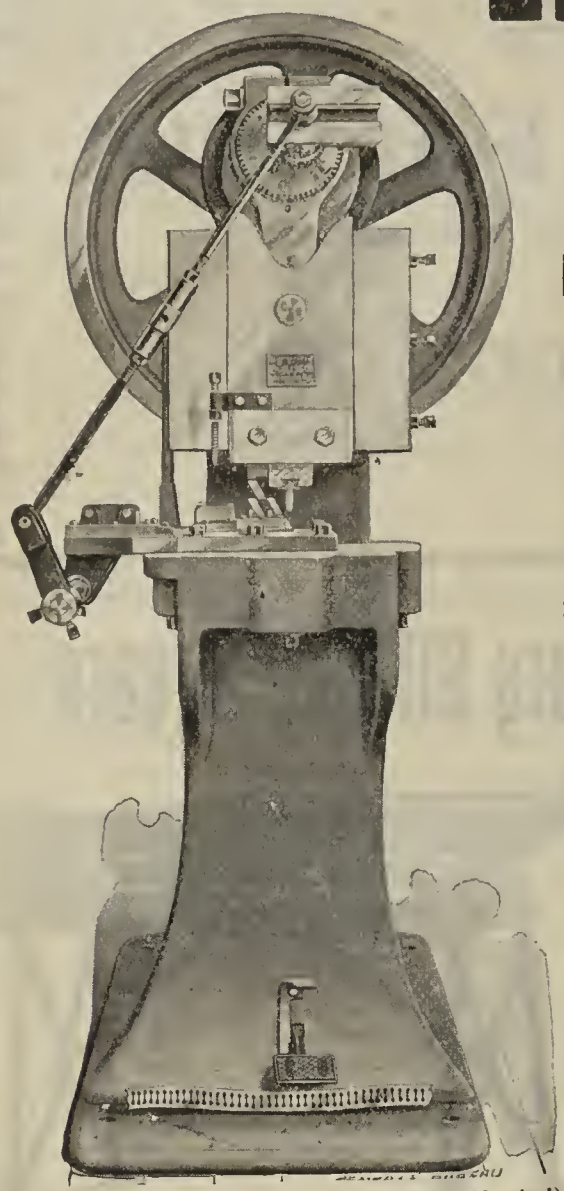
H. LINDAS, - Edgerton, Wis.

CHICAGO: 96 W. Washington St.
WATCH OUR SPACE.

E. W. BLISS CO.,

16 Adams St., Brooklyn, N. Y.
WATCH OUR SPACE.

OWNING AND OPERATING
THE STILES & PARKER PRESS CO.
400-PAGE CATALOGUE OF OUR
DROP HAMMERS, PRESSES,
DIES, SHEARS, AND SPECIAL MACHINES FOR
SHEET METAL WORK.

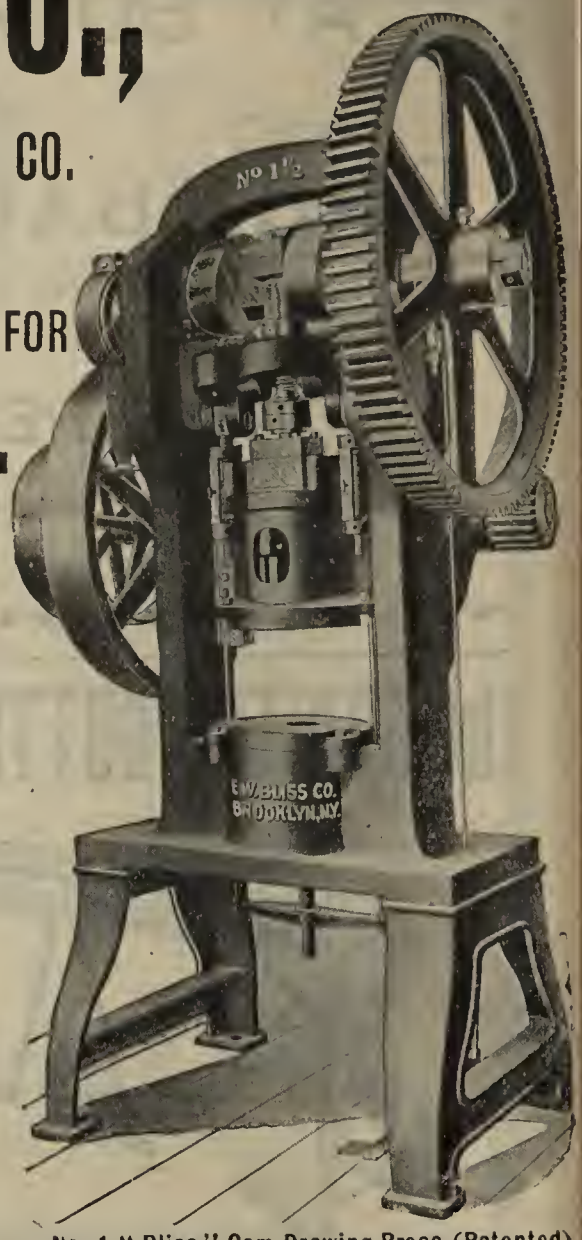


No. 2 "Stiles" Press, with Tube Feed (Patented).

Tools and Machines for the Manufacture of

Light and Shelf Hardware,
Seamless and Pieced Tinware,
Enameled Iron Ware,
Electrical Specialties,
Armature Core Discs,
Bicycle Parts and Fittings,
Locks, Clocks, Cash Registers,
Cutlery, Albums,
Lamps, Lanterns,
Metal Novelties, Etc., Etc.

CORRESPONDENCE SOLICITED.



No. 1 "Bliss" Cam Drawing Press (Patented)

SPECIAL CATALOGUES OF
BICYCLE AND ELECTRICAL TOOLS.

ADJUSTABLE FOOT PRESS.



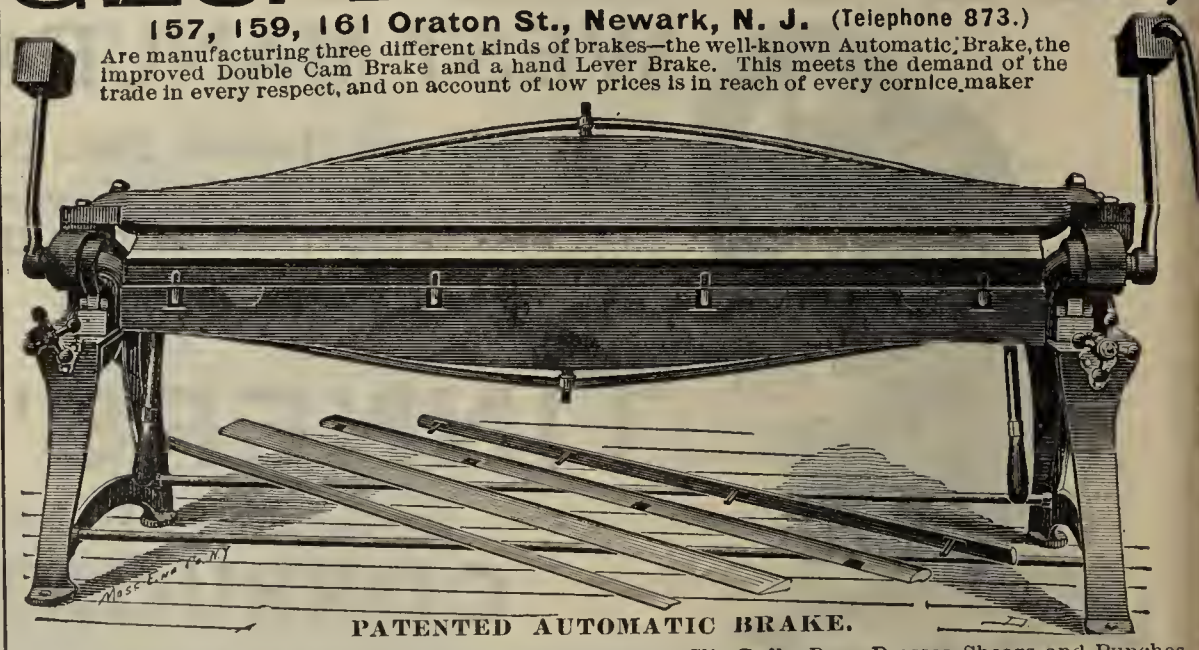
This Foot Press has several desirable features. Send for descriptive circular and prices of this press and of Punches and Shears.

Manufactured by
R. M. CLOUGH,
TOLLAND, - - CONN.

SCHWERDTLE & SIEBERT,
STENCILS-BURNING BRANDS
STEEL STAMPS & DIES
SEALS-MACH. PLATES-CHECKS
BRIDGEPORT, CONN.

GEO. A. OHL & CO.,

157, 159, 161 Oraton St., Newark, N. J. (Telephone 873.)
Are manufacturing three different kinds of brakes—the well-known Automatic Brake, the improved Double Cam Brake and a hand Lever Brake. This meets the demand of the trade in every respect, and on account of low prices is in reach of every cornice maker



PATENTED AUTOMATIC BRAKE.

We also manufacture Circular Machines, Squaring Shears, Slip Rolls, Drop Presses, Shears and Punches, Scroll Shears, Brace, Angle Iron and Wire Benders, and all machinery used by sheet-metal workers. Special attention called to our improved Hammering Machines. Send for our illustrated catalogue.
Sole Manufacturers of the Vulcan Machinery.

SHEET METAL TOOLS ALL KINDS.

Presses, Dies, and Special Machinery.
ADRIANCE MACHINE WORKS, 169 Plymouth Street, Brooklyn, N. Y.

IMPROVED
PATENT AUTOMATIC CAN BODY
Lock Seaming
Machines.

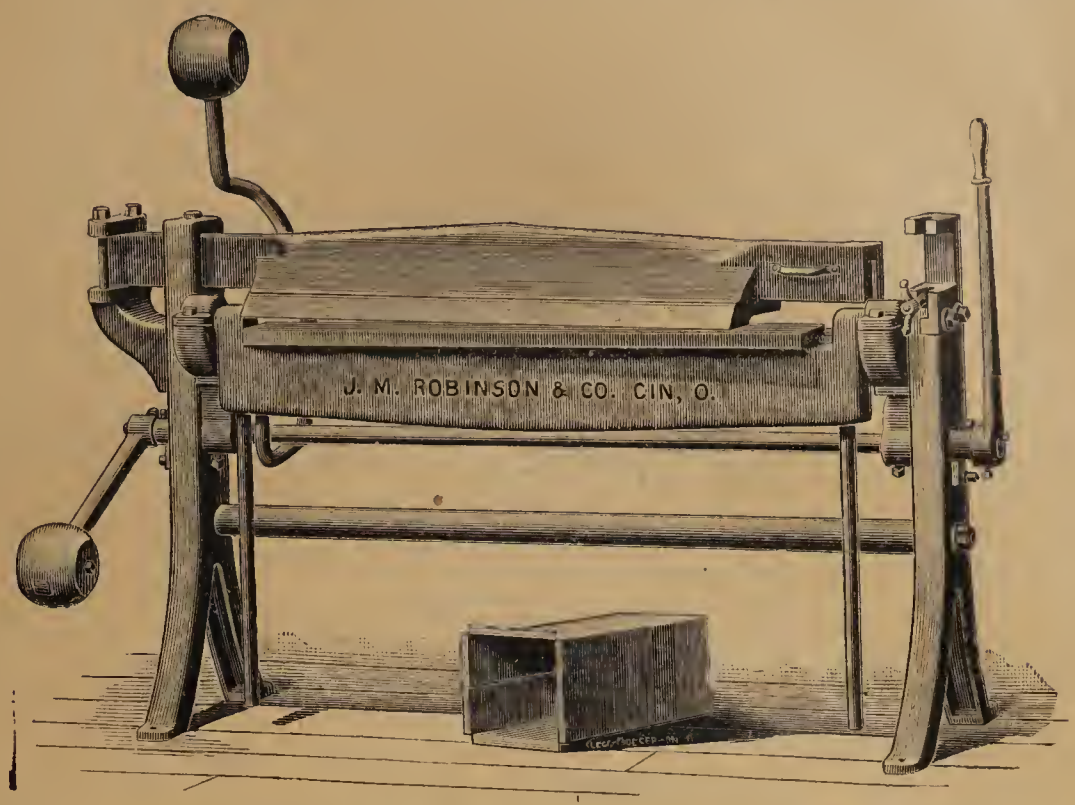
COMBINATION
Presses and Dies,
SHEET METAL TOOLS, &c.
W. J. GORDON 218 New St., PHILADELPHIA, PA

—London Scene in the Sixtieth of Victoria.—A pathetic incident took place on the embankment in the early hours of Wednesday morning. Three men who had on the previous evening obtained a thousand wrappers each to address found themselves unable to raise the price of a lodging, and so as soon as the daylight was sufficient they began to work at fresco. Luckily they had pen and ink, and, squatted on a seat, they began to write, making a desk of their knees. More than once they were moved on, but they persevered, and by 10 o'clock they had each done 500 of the 1,000, for which they received 1s. 6d. apiece. They were then able to go to a lodging to finish their task, and have what no one will deny was a well-earned breakfast. As one of the men said: "We are used to it."—*London Daily News.*

RANGE BRAKES.

4-FOOT OPEN END RANGE BRAKE,

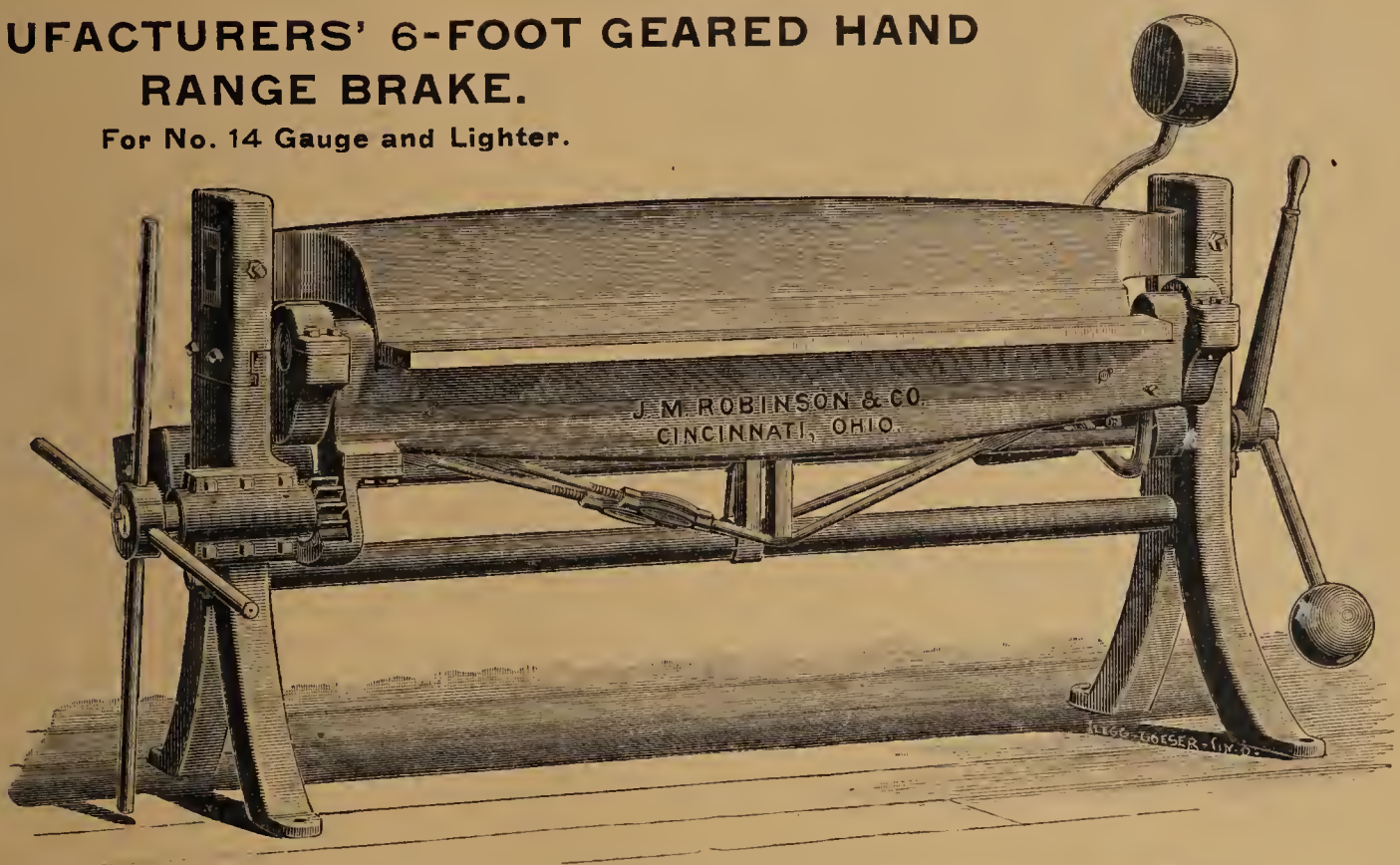
for bending a four-sided figure, and removing same from open end without marring its shape. Same brake will do all ordinary bending and flanging of No. 14 gauge and lighter in four lengths or less. A favorite with manufacturers of family ranges.



RANGE MANUFACTURERS' 6-FOOT GEARED HAND RANGE BRAKE.

For No. 14 Gauge and Lighter.

Possesses all the features of the power brake made from the same patterns. Bending bar is operated with a pilot wheel, and imparts great power to the bending bar through the medium of spur gearing meshing into segment attached to the bending bar.

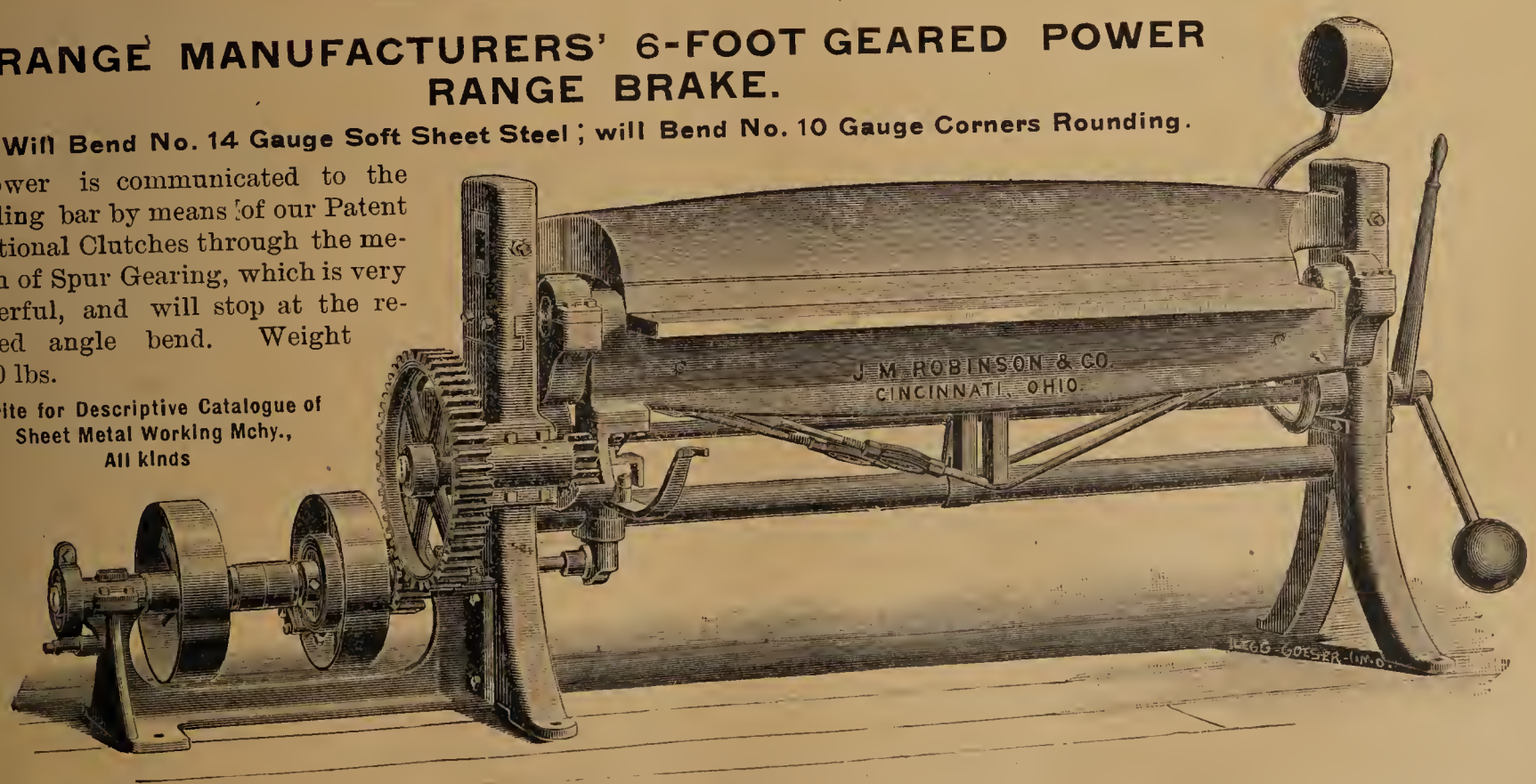


RANGE MANUFACTURERS' 6-FOOT GEARED POWER RANGE BRAKE.

Will Bend No. 14 Gauge Soft Sheet Steel; will Bend No. 10 Gauge Corners Rounding.

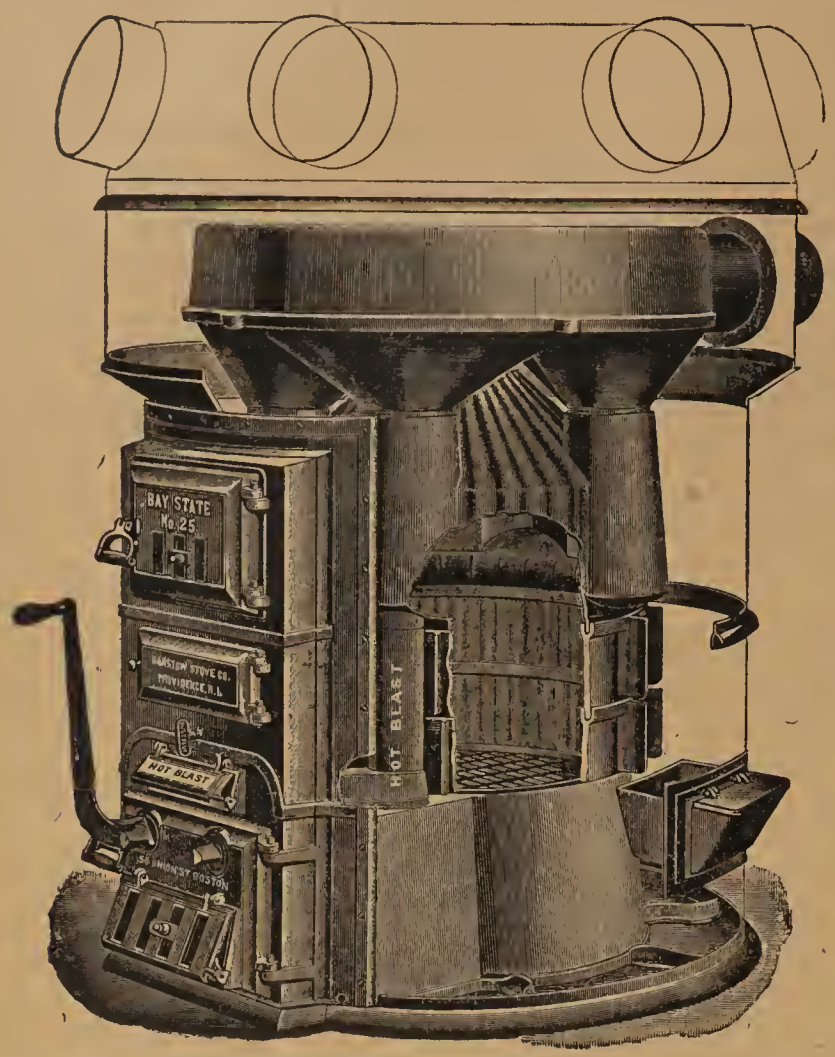
Power is communicated to the bending bar by means of our Patent Frictional Clutches through the medium of Spur Gearing, which is very powerful, and will stop at the required angle bend. Weight 4,500 lbs.

Write for Descriptive Catalogue of Sheet Metal Working Mchy., All kinds



J. M. ROBINSON & CO., - 225-229 West Second St, Cincinnati, O., U. S. A.

NEW 1897
Bay State Furnace.



SECTIONAL FIRE POT, AIR BLAST, TRIANGULAR GRATE.

BARSTOW STOVE COMPANY,

NEW YORK. PROVIDENCE. BOSTON.

A HAPPY and PROSPEROUS NEW YEAR....

Is again offered to our friends on the occasion of our

89th Annual Greeting.

N. & G. TAYLOR CO.,

Manufacturers of Tinplate,

Established 1810. PHILADELPHIA.



The Great CHURCH LIGHT. Frink's Patent Reflectors for Gas, Oil or Electric, give the most powerful, softest, cheapest and best light known for Churches, Stores, Banks, Theatres, Depots, &c. New and elegant designs. Send size of room. Get circular and estimate. A liberal discount to churches and the trade. *Don't be deceived by cheap imitations.* I. P. FRINK, 551 Pearl St., N. Y.

L. & R. WISTER & CO.,

Bullitt Building, Philadelphia.

Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Allentown Iron Co.
Warner & Co.'s Wash Irons.

Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COOK

TINNERS' TOOLS and MACHINES

TINNERS' SUPPLIES

186, 188 & 190 Water Street, a
248 & 250 Pearl Street.
NEW YORK.

"WILLIS SAP SPOUT



"In one piece, with hook. Made fro
"Tinned Malleable Iron. Will not breal
"Far superior to all others.

"SEND FOR CIRCULAR OF MAPLE SUGAR GOODS.

"CHARLES MILLAR & SON, Utica, N.Y.



W. Dewees Wood Co. McKeesport, Pa

Sole Manufacturers of Wood's Smooth Iron
Patent Planished Sheet Iron

Good Judgment

and Common Sense in a large degree is displayed by the stove dealer who refuses to deal in varieties and job lots, but wisely decides that whatever of money or talent he may have, it shall be expended to further the sale of ONE good reliable line, one sure to bring future business.

That man should handle the

GLENWOOD.

Write the Weir Stove Co., Taunton, Mass.

HEATER PIPE TIN.

We have the following sizes in stock :

IC & IX, 20 x 26, for 8 in. pipe.
IC & IX, 20 x 29½, " 9 in. "
IC & IX, 20 x 32½, " 10 in. "
IC & IX, 20 x 35¾, " 11 in. "
IX, 20 x 39, " 12 in. "
"Cupola" Brand.

Superior quality and finish. We invite correspondence before buying.

McCLURE & CO.,

PHILADELPHIA, 115 North 7th St. **PITTSBURG, PA.,** 211—213—215 Second Ave.

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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

. XLIX. } NEW YORK AND CHICAGO, JANUARY 8, 1898. { ONE DOLLAR A YEAR.
IBER 2. } { SINGLE COPIES, 5 CENTS.

WHY

have so many stove and furnace makers renewed their contracts for 1898 for the

American Seal.

BECAUSE

it is the best STOVE PUTTY and FURNACE CEMENT in the market.

Always uniform in quality.
It stands more heat.
It gives better satisfaction.
Can i send you a sample barrel?

WILLIAM CONNORS, - - TROY, N. Y.

The "Gorton Side-Feed" Boilers

WILL BURN HARD OR SOFT COAL.

You Want the Best. We Have It.

SEND FOR CATALOGUE AND INVESTIGATE FOR YOURSELF.

GORTON & LIDGERWOOD CO., 96 Liberty St., New York.

197-203 Congress St., Boston. Old Colony Bldg., Van Buren and Dearborn Sts., Chicago.

Diamond Thimbles. S. CHENEY & SON, Manlius, N. Y.

EASTWOOD VALVE.

EASTWOOD WIRE MFG. CO., - Belleville, N. J.

Don't Put an Enemy

in your customer's kitchen to steal away her good opinion of you.

EXCELSIOR RANGES

not only do all her work without a single drawback. They also speak well for you and your whole business.

ISAAC A. SHEPPARD & CO.

There are More Points

to talk about about the Paragon Furnaces than are found in all other furnaces put together.

PARAGON FURNACES

are easy to sell because they are satisfactory to use.

Philadelphia and Baltimore.

TRADE APOLLO BEST BLOOM MARK

"WE USE APOLLO STEEL,"

he said,

ut somebody lied.

We are told that a certain galvanized-iron Mill retends to be buying black sheets of us and dipping iem.

We don't sell black sheets to galvanizers.

Apollo Iron and Steel Company, Pittsburgh, Pa.

Copper Range Boilers.

We furnish these tested to 200 pounds and guaranteed against collapse, and for use under heavy pressure. They cost a little more than iron, but are not only more durable but have a value as old copper which is a handsome percentage of cost.

E. S. WHEELER & CO.,

256 Water St., New Haven, Conn.

New York Store, 194 Front St.
Boston Office, 220 Devonshire St.

THE WILLIAMS PRINTING COMPANY,

COMMERCIAL PRINTERS AND BINDERS,

232-238 WILLIAM STREET, - - - NEW YORK.

WILLIAMS STOVE LINING CO.,

TAUNTON, MASS., Manufacturers of **FIRE BRICK LININGS.**

RADIATOR VALVES.

Steam Traps, Pump Governors, Water Seal Automatic Air Valves, Back Pressure Valves, Pressure Regulating Valves.

JUDSON A. GOODRICH CO.,

120 BEEKMAN ST., - - NEW YORK.

team Specialties.

ump Governors, Noiseless Back
team Traps, Pressure Valves,
team and Water Water Arches,
educing Valves. and Oil Separators.
ank Temperature Controller.

KIELEY, 9-17 W. 13th St., NEW YORK.

JENKINS AUTOMATIC AIR VALVES



with Drip-pipe Connections insure perfect circulation. You are not annoyed with escaping steam or dripping of water. They are stamped with our Trade-Mark.

JENKINS BROTHERS,

New York, Boston, Chicago, Philadelphia.

THE **MAGEE**

CATALOGUE

Shows a complete line of cooking and heating apparatus.

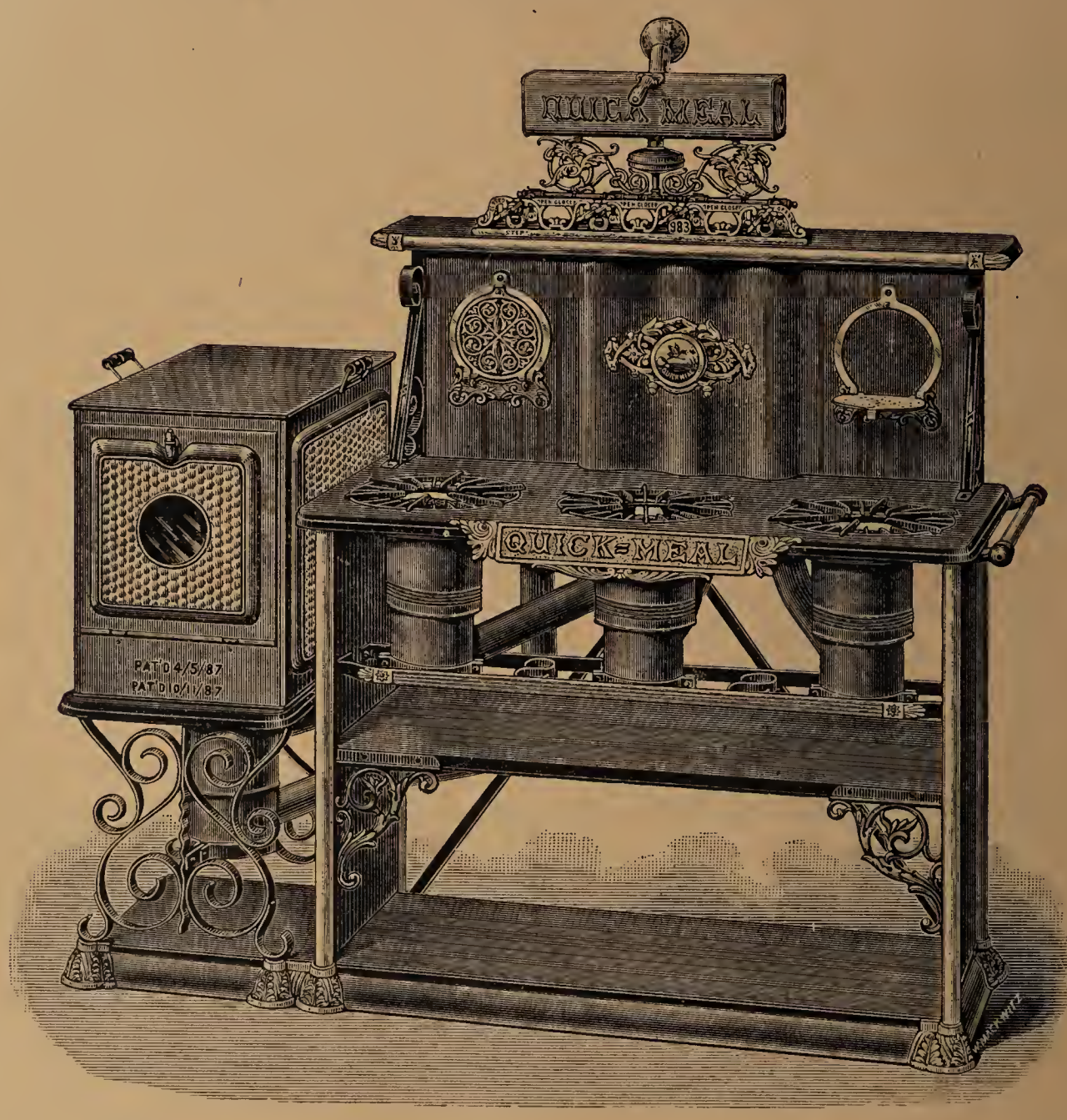
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MAGEE FURNACE CO., Boston, Mass



QUICK MEAL

Gasoline Stoves



Are easy sellers because their points of superiority are so many and so marked that customers can see them at once. No brain racking is necessary to find talking points for the Quick Meal Gasoline Stoves.

Then the name is one that is known everywhere and is a recommendation in itself. Then the ornamentation is so rich and tasteful. There is just enough of it; neither too much nor too little. Quick Meal Gasoline Stoves sell and satisfy.

Don't forget the "Quick Meal" Steel Range. It is still the "Best."

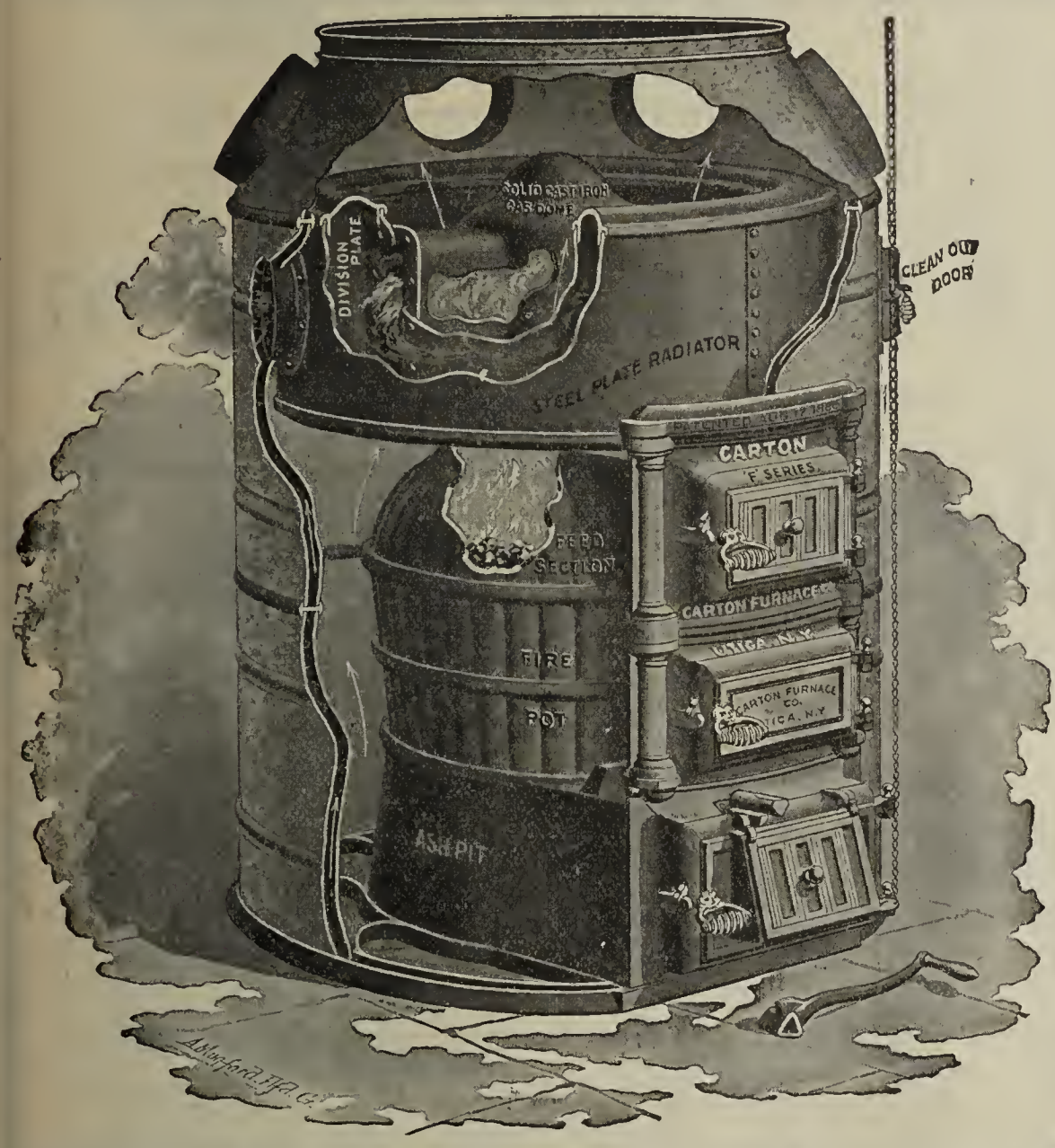
RINGEN STOVE Co. SAINT LOUIS

Carton

Hot Water & Steam Boilers & Furnaces.

OUR NEW

Carton "F" Series.



GERKEN & NEIPP,

Sales Agents "CARTON" Furnaces.

TOLEDO, OHIO, Dec. 21, 1897.

Messrs. GERKEN & NEIPP.

DEAR SIRS :—The **Carton** Heater placed in my **14-room residence** has far exceeded my expectations and your claims. The bare fact of its only consuming **8 tons of coal,** a **saving of 50 per cent.** in my **coal bill,** is a practical illustration of an important point of merit over all other heaters. Its **ease** of **management,** freedom from **gas** and **dust** are commendable features. It is a **quick, sharp Heater** and easily controlled. In my experience with other heaters I emphatically pronounce the **"Carton" far ahead of all others.**

Yours truly,

R. W. SUSSMAN

SEND FOR OUR GOLDEN JUBILEE ANNIVERSARY FURNACE CATALOGUE---1847-1897.

If Interested in Steam and Water Boilers—we make a most complete line, and you should send for our New Boiler Catalogue and Prices.

CARTON FURNACE CO.,

Makers of Heating Apparatus for the past *50 Years,*

UTICA, N. Y.

Warm Air Furnaces (Thirteen Patterns).

Combinations (Six Patterns).

Steel Tubular Steam Heaters.

Hot Water Heaters (Three Patterns).

1600 DEALERS SELL THESE HEATERS.

The Dealers Favorite Line

ECONOMY Heaters & Furnaces

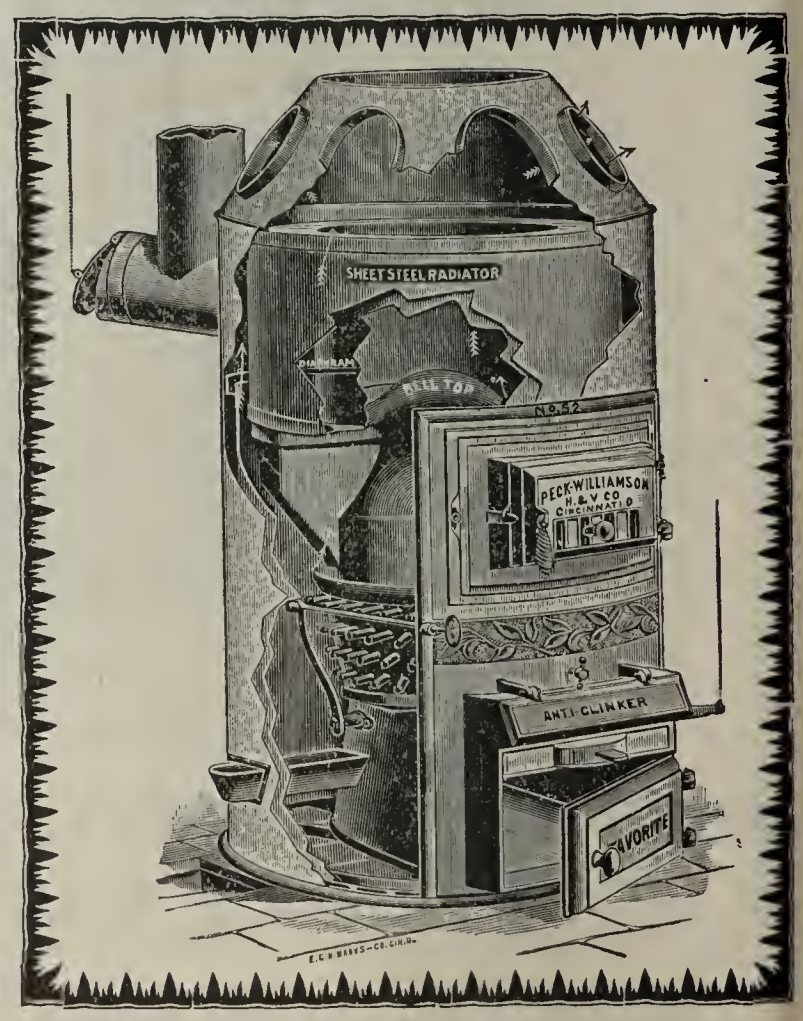
FOR
Hard Coal, Soft Coal, Lignite, Coke or Wood.

Before selecting a line of apparatus to sell in 1898 ask for our prices and Catalogue—we can interest you.

J. F. PEASE FURNACE CO.,

SYRACUSE, N. Y., and CHICAGO.

Without a Defect



The Favorite Furnaces are so recognized and endorsed everywhere because ***they are***. Our agents have never had to take one out or substitute another make. They are constructed on honor, and to use them is to attain that satisfaction in a heating apparatus so essential but difficult to obtain. Can't you place one or more in your vicinity? We ship same day order is received. There's money in it for you, Dealer.

The Peck-Williamson Heating & Ventilating Co.

HOME OFFICE AND FACTORY,

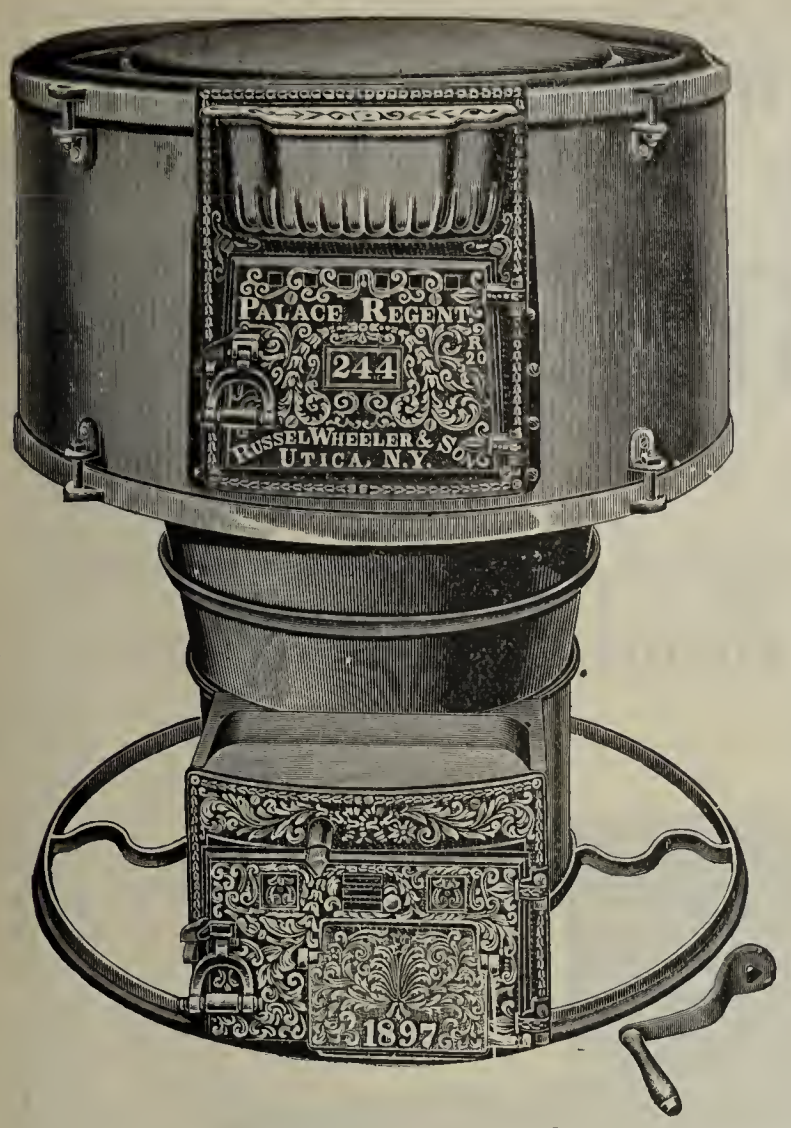
335-337-339 West Fifth Street,
320-322-324 Perry Street,

CINCINNATI, O.

526 to 532
Freeman Avenue.

BRANCH OFFICES:

New York, N. Y. | St. Louis, Mo. | Pittsburg, Pa. | Cedar Rapids, Ia. | Memphis, Tenn.
Atlanta, Ga. | Columbus, O. | Houston, Tex. | San Francisco, Cal.



RUSSELWHEELER & SON
Wheeler
TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.

WHEN THE NEW YEAR COMES, LOOK OVER THE OLD YEAR'S BUSINESS.

If you haven't made money, look about you for a better line of goods.

TRY OURS.

If they don't make money for you, and satisfy you, by January 1st, 1899, then you will be the exception to the rule among our customers, and you had better look after your way of doing business, and not your goods.

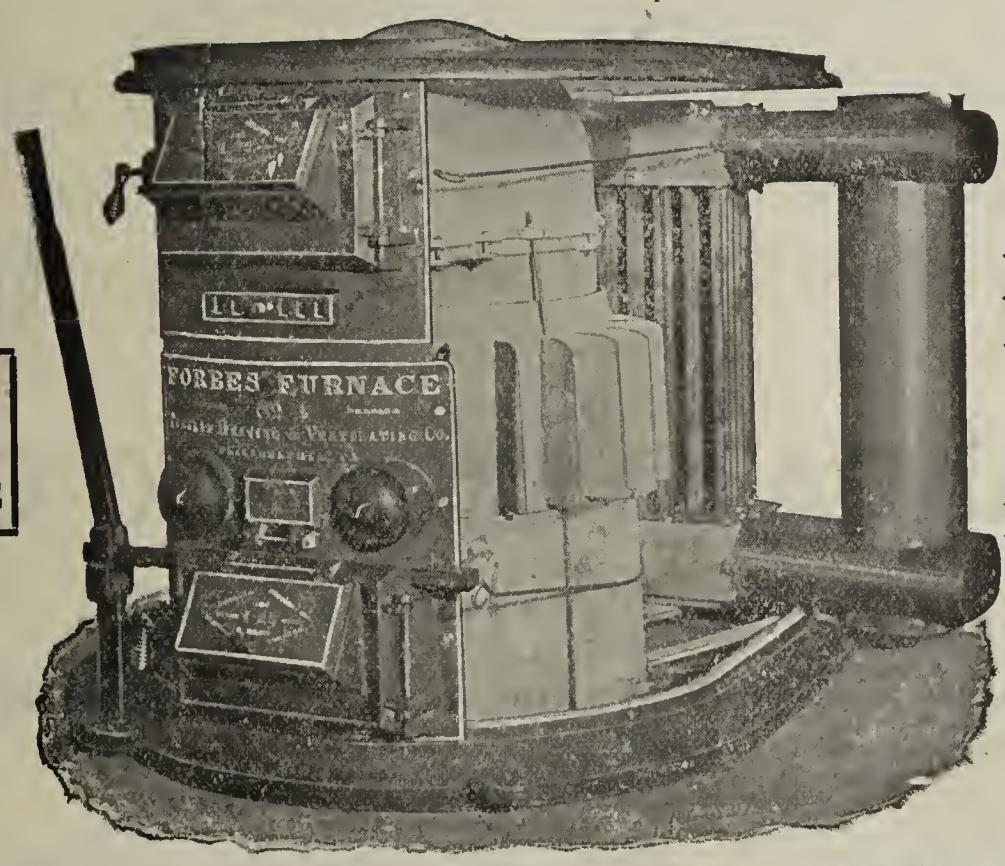
THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,
REAL ESTATE,
HATBORO, PA.

TUESDAY AND FRIDAY,
221 SOUTH FIFTH STREET,
PHILADELPHIA.

HATBORO, PA., Dec. 26th, 1896.

MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.
MY DEAR SIR:
In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal.
Very truly,
I. N. EVANS.



SEND FOR CATALOGUE

COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

☞ Only 4 ft. 3 in. High in the Largest Sizes.

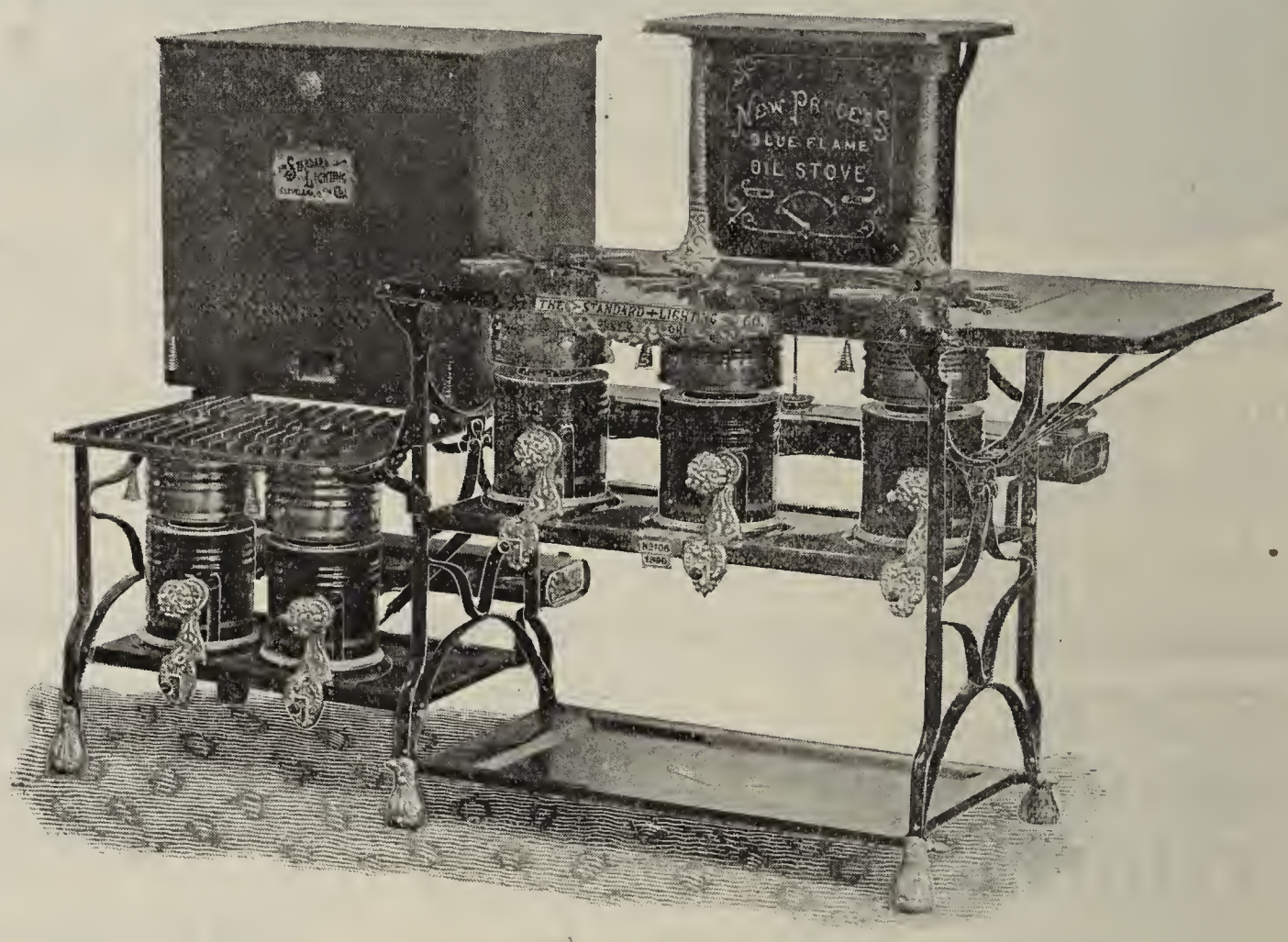
LOW PRICE.

TUBULAR HEATING AND VENTILATING CO.,

228 QUARRY STREET, PHILADELPHIA.

THE "NEW PROCESS" BLUE-FLAME OIL WICK STOVE.

This is the ***third*** season for this wonderful stove. It has been much improved and is now supplied with highly polished ***Brass Drums*** and ***Aluminum Bronze*** perforated cylinders, which are fire and rust proof.



The "New Process" is the ***original*** Blue-Flame Oil Stove. Attempts have been made to copy it without success. Ask your dealer for the "New Process," and if he does not have it in stock, write to us.

THE STANDARD LIGHTING CO.,

100-120 Perkins Ave., CLEVELAND, OHIO.

The "New Process" Blue-Flame Oil Wick Stoves will be sold this season by the following Jobbers:

The S. M. Howes Co., Boston, Mass.
F. M. Borden & Bro , Philadelphia, Pa.
Eugene Munsell & Co., New York, N. Y.
The F. H. Lawson Co., Cincinnati, Ohio.
The O. K. Stove & Range Co., Louisville, Ky.
The Phillips & Buttorff Mfg. Co., Nashville, Tenn.
The T. B. Rayl Co., Detroit, Mich.
Cook & Van Evera Co., Chicago, Ill.
Townley Stove Co., Terre Haute, Ind.
Townley Metal Co., Kansas City, Mo.
Knapp & Spalding Co., Sioux City, Iowa.
Farwell, Ozmun, Kirk & Co., St. Paul, Minn.
Kellogg & Stokes, Denver, Colorado.
Holbrook, Merrill & Stetson, San Francisco, California.
The Thos. Davidson Mfg. Co., Ltd., Montreal, Quebec, Canada.

DO NOT SPECULATE

IN

Cheap or Experimental

LINES OF

Vapor or Oil Cooking Stoves.



The average mortal has troubles enough of his own without buying those of his neighbor.

Speculation in any of the above mentioned lines will drain your purse and put you to a world of trouble.

Seeds of prudence now well sown in the selection of a line that is both complete and honest will yield a profitable and happy harvest. A good beginning for 1898 means half the battle won.

If you are interested in the handsomest line made, write for our catalogue.

EXCLUSIVE AGENCIES GIVEN.

THE SCHNEIDER & TRENKAMP CO.,

CHICAGO, ILLINOIS. CLEVELAND, OHIO.

Jewel Security

Gasolene Stoves

THE NE
BEST

If Flames are Bl
Left

NOT A DROP OF



LIGHTED BY GAS IN 30 SECONDS.

NO NEEDLE VALVES TO WEAR OR BREAK.

IMPOSSIBLE TO FILL TANK

WHILE LIGHTED.

No. 545. WITH END

THREE BURNERS ON TOP AND SIMME

IN REALITY

CATALOGS READY JAN. 10th. DROP US

GEORGE M. CLARK & COMPANY, MA

WHOLES

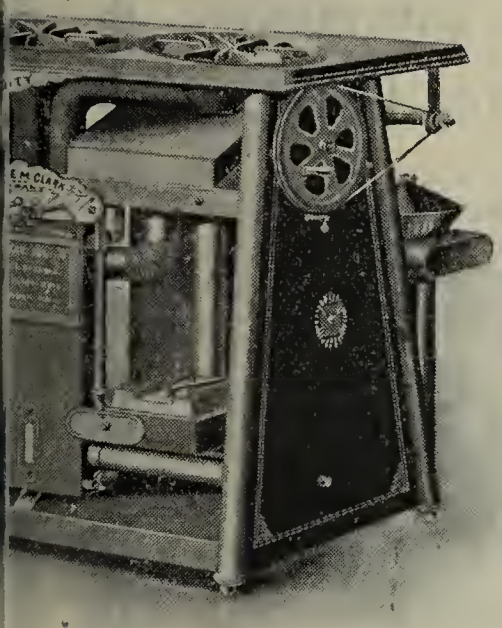
(Better secure the Age

Nebraska,	-	-	-	-	GREAT WESTERN STOVE CO.,	Omaha, Neb.
Minnesota, North and South Dakota,	-	-	"	"	"	" St. Paul, Minn.
Kansas, Western Missouri, Northern Texas	-	-	"	"	"	" Leavenworth, Kan.
Colorado, New Mexico and Arizona,	-	-	"	"	"	" Denver, Colo.
Utah, Idaho, Montana, Wyoming,	-	-	"	"	"	" Leavenworth, Kan.
California,	-	-	W. W. MONTAGUE & CO.,			San Francisco, Cal.

Y YEAR'S GIFT.

vn Out or Valves)pen

ASOLENE ESCAPES.



OR, RUSSIA OVEN.

NG BURNER; TWO BURNERS ON STEP.

GAS STOVE.

POSTAL TO MAKE SURE YOU ARE LISTED.

DLE
CTURERS,

72=74=76 Lake Street, CHICAGO.

Jewel Security

Gasolene Stoves

ABSOLUTELY ODORLESS, IN LIGHTING,

WHILE BURNING,

AND WHEN FLAMES ARE

TURNED OUT.

AGENTS:

n your town AT ONCE.)

Central Illinois,	H. SANDMEYER & CO., Peoria, Ill.
Southern Illinois, So. Indiana, Kentucky, Tennessee, Alabama, Georgia,	STRATTON & TERSTEGGE, Louisville, Ky,
Louisiana,	HENRY RICE & SON, New Orleans, La.
Texas,	HOWARD W. PEAK, Fort Worth, Texas

TO ALL DEALERS IN "BLUE FLAME" OIL STOVES, GREETING.

This Company owns and controls fifteen Letters Patent, which in the expert opinion of our attorneys fundamentally cover all rights to manufacture "Blue Flame" Oil Stoves. In order to test their validity we have brought suits in the United States Circuit Court against the stoves made by certain manufacturers. We have granted licenses to manufacture to

The Cleveland Foundry Company Cleveland, Ohio.
The Dangler Stove & Mfg. Company, " "
The Standard Lighting Company, " "
The Schneider & Trenkamp Company, " "
The A. C. Barler Mfg. Company, Chicago, Ill.
The Quick Meal Stove Company, St. Louis, Mo.
The Monarch Stove Company, Mansfield, Ohio.
The A. J. Lindemann & Hoverson Company, Milwaukee, Wis.

We hereby notify the trade that, in the event our patents are sustained, we will ***collect damages*** from all parties selling "Blue Flame" Oil Stoves made by any manufacturer not licensed by us.

Respectfully

The United Blue Flame Oil Stove Company,

Cleveland, Ohio.

WE have the best and can prove it.

We are the Originators of Wickless Oil Stoves.

The Puritan Wickless

BLUE FLAME OIL COOKING STOVE.

It Burns the vapor—not the oil—hence no smell of oil.

The only stove ever made that burns either Coal Oil or Gasoline.

No Soot. No Smoke. No Odor. No danger of wrong fuel.

The simplest stove ever made. Only three parts to the burner, it cannot get out of order.

4-inch Burners.
Largest Flame.
Most Economical.
Perfectly Safe.
High or Low Flame.



Up Feed Valves Never Clog.
Flame Always Even and Steady.

SEE THE CABINET FRAME AND WARMING CLOSET.

We will prove our claims by sending a sample stove to any responsible dealer subject to return if not satisfactory.

WRITE FOR CATALOGUE A.

The Cleveland Foundry Co.,

Cleveland. Boston. San Francisco.

HIGH GRADE HEATERS.

Some Dealers Look to the profit they make on the sale of a single furnace, and if a cheap furnace is used the profit looks large when the contract

Is Made.

When this cheap furnace fails to heat, and gives out in the middle of winter, the dealer is obliged to alter and readjust the setting, secure repairs for his furnace, and in the end the entire profit

Is Wiped Out

and great disgust follows to both the purchaser and the dealer.

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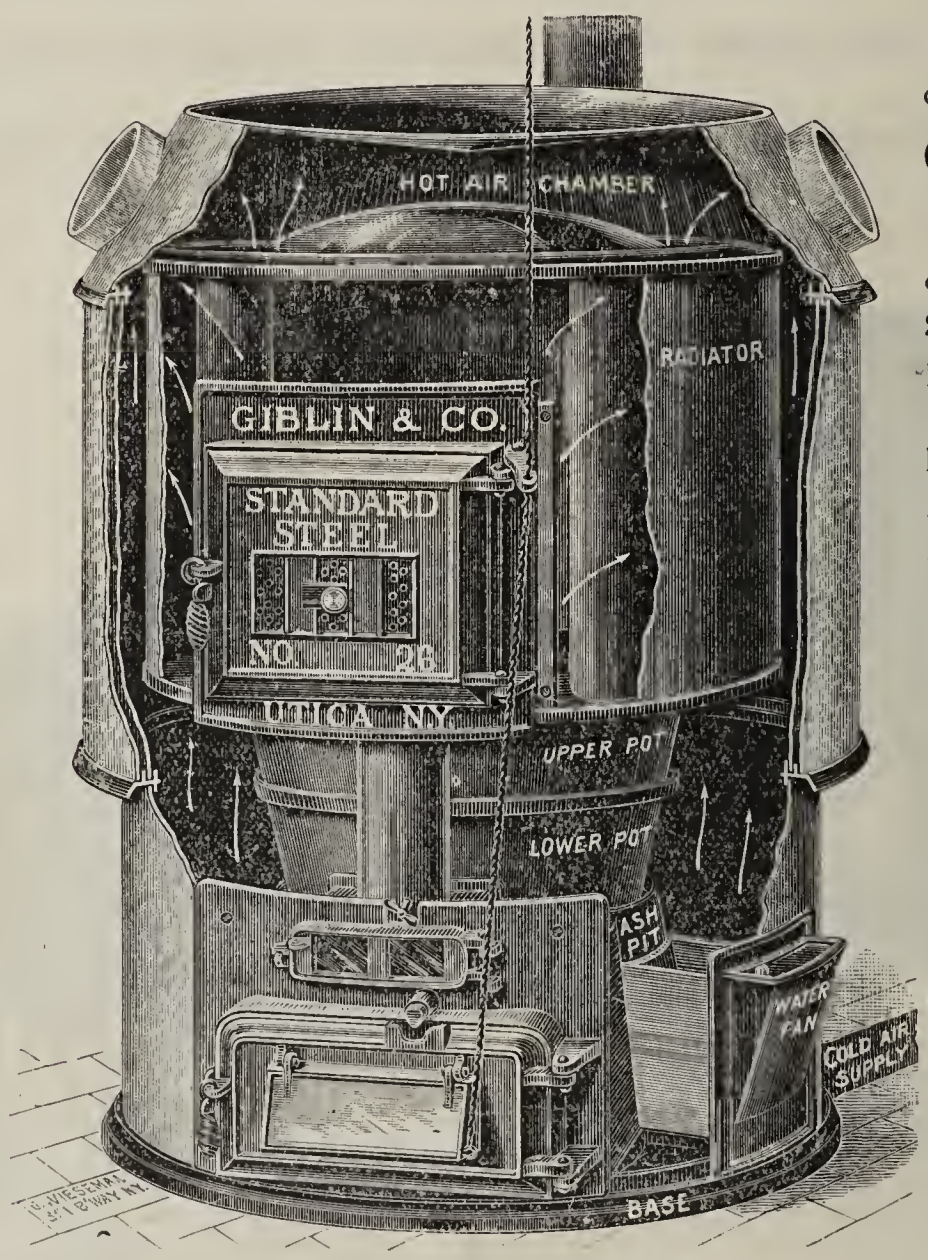
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Good Furnace,

one that is

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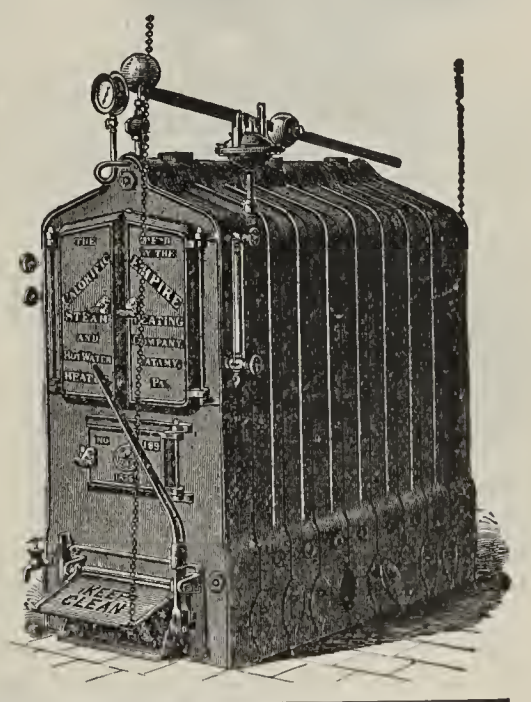
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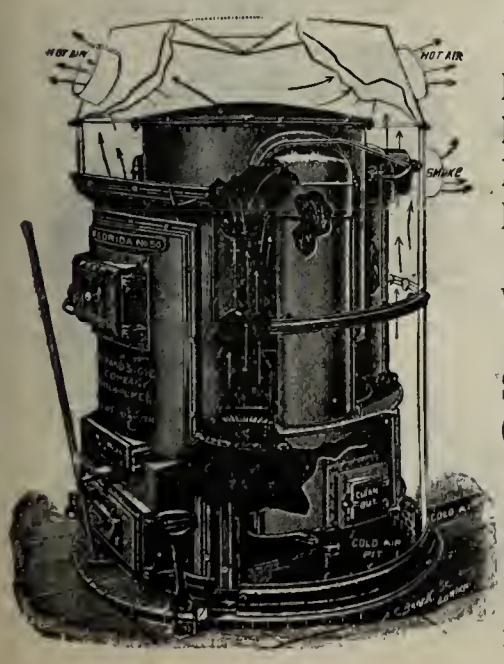
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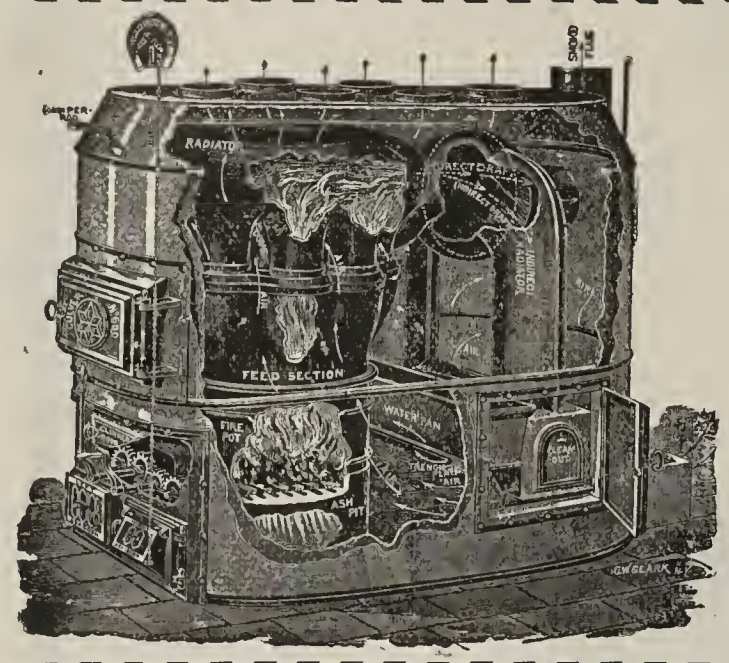


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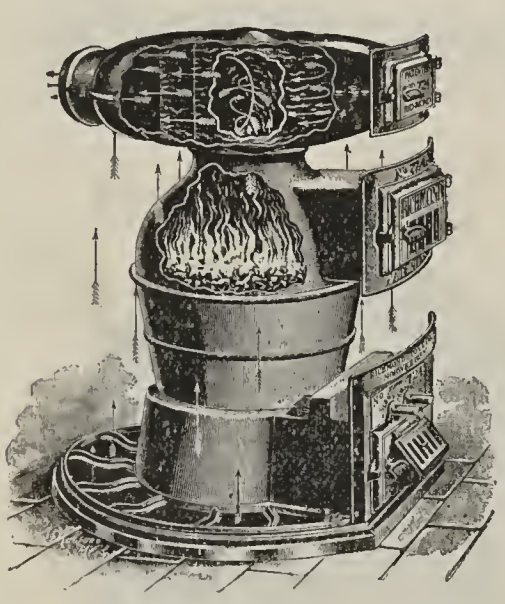
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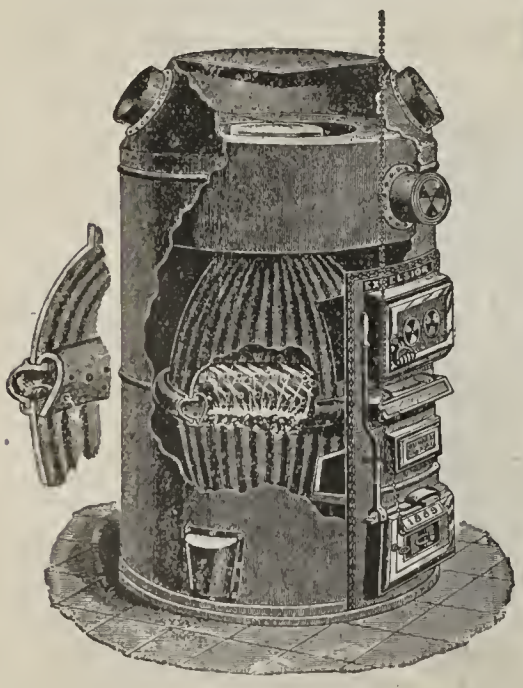
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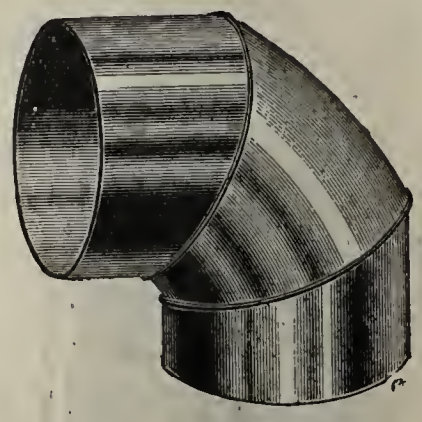
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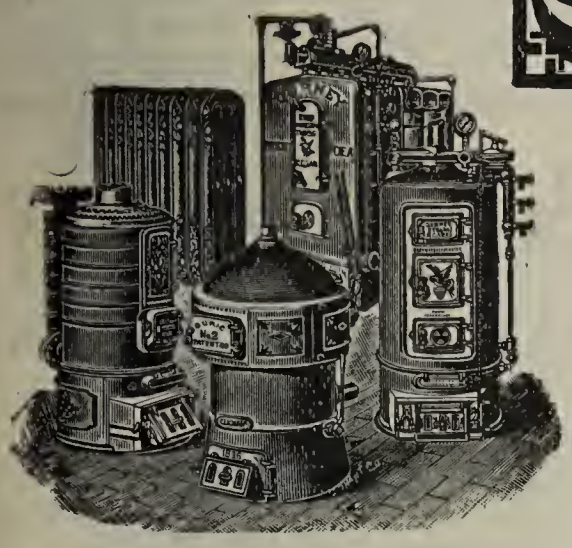
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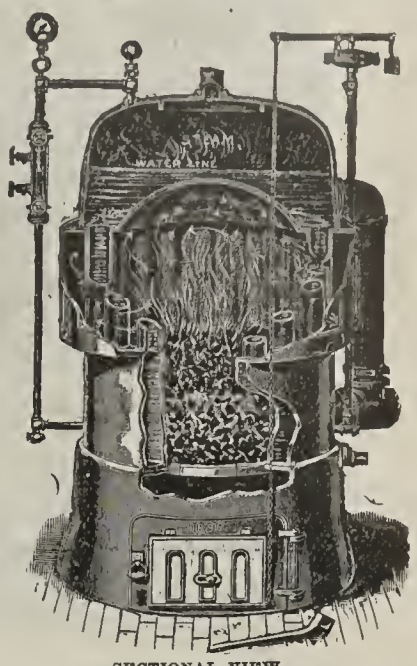


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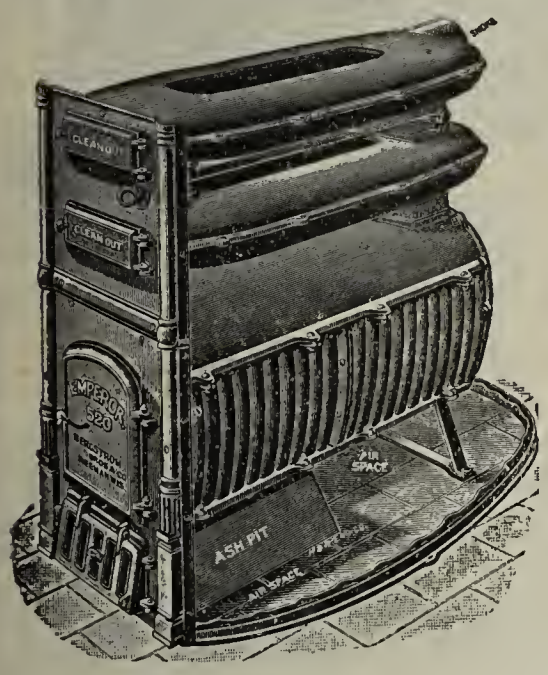
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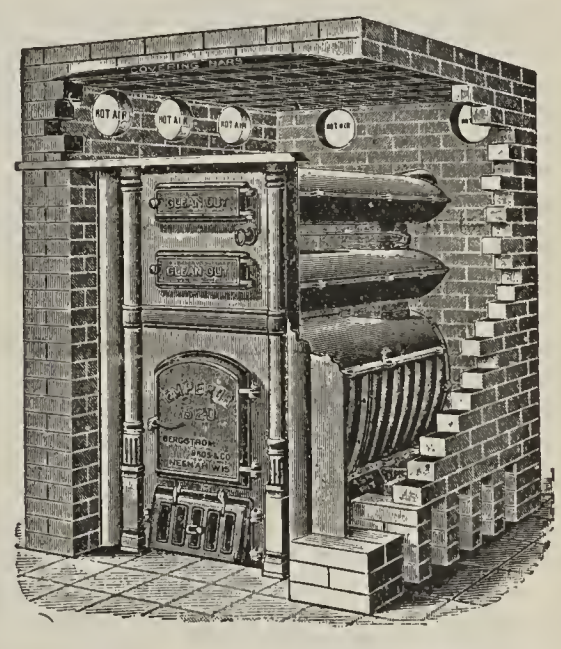
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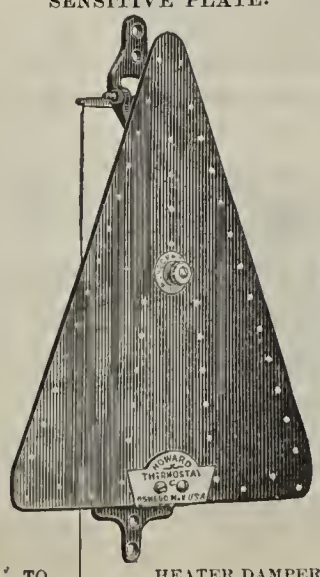
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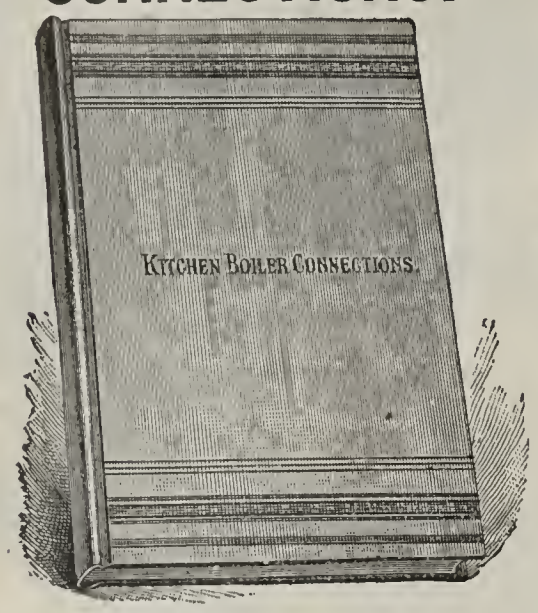
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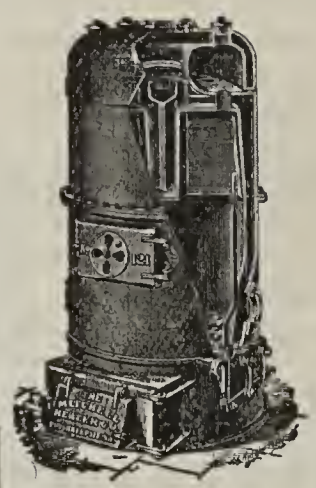
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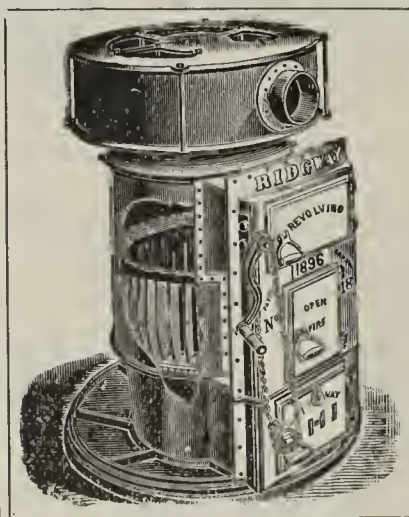
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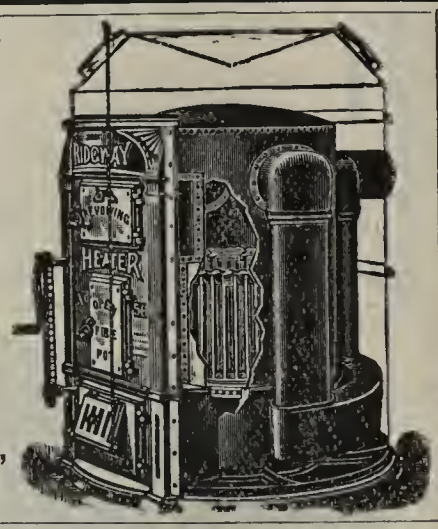


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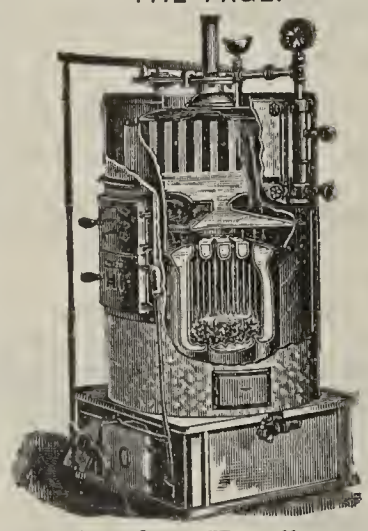
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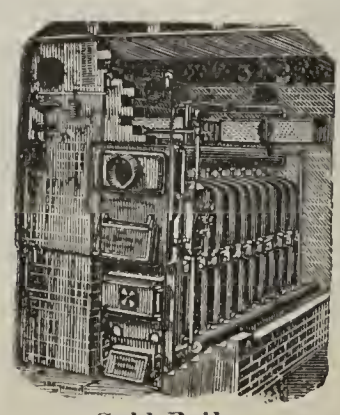
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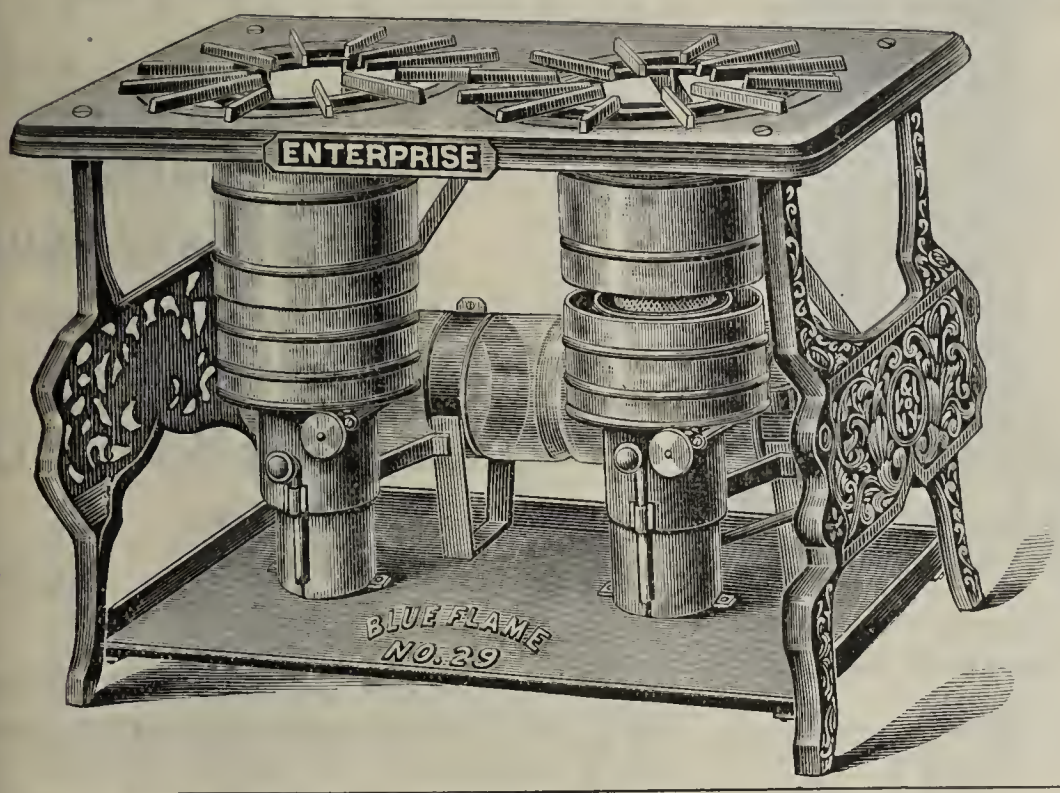
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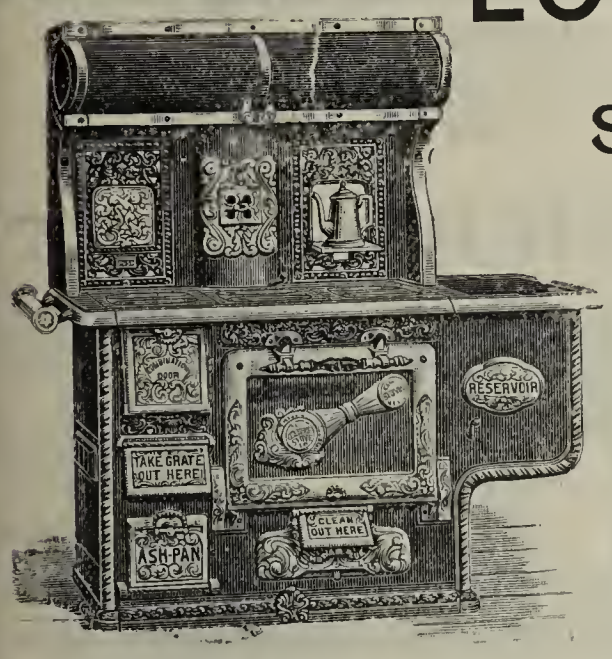
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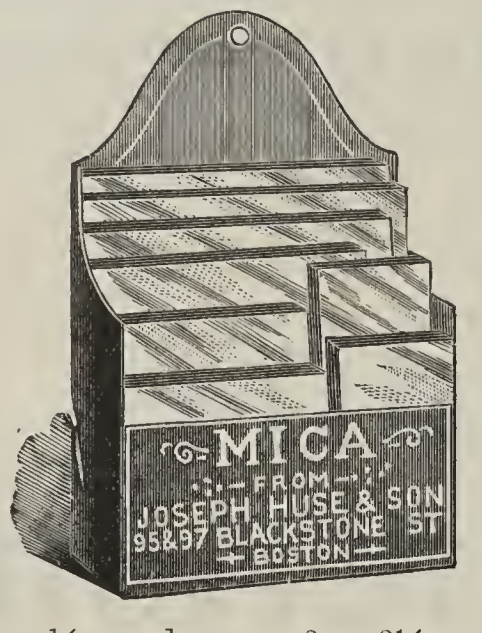
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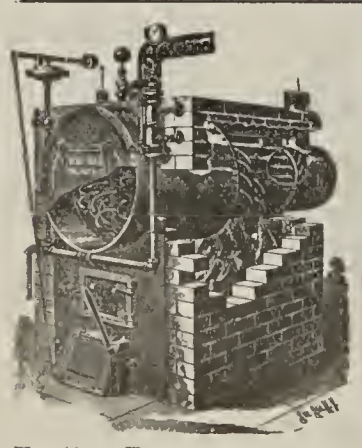
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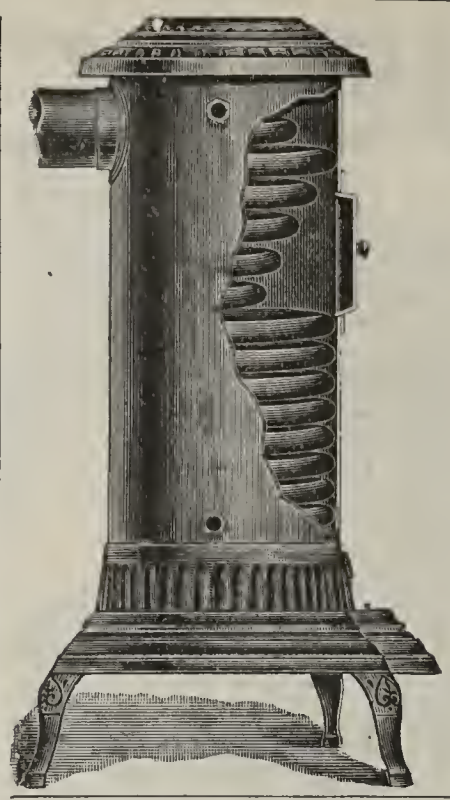
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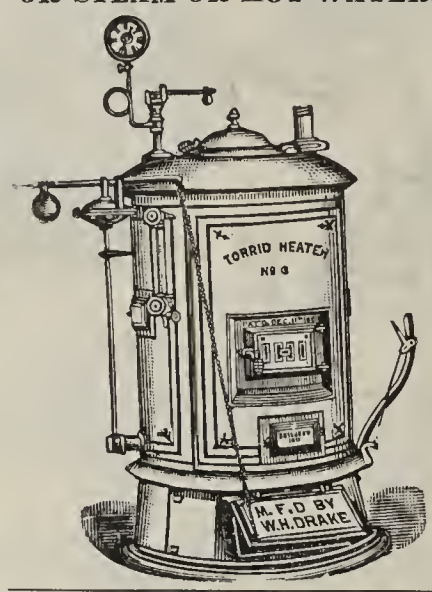
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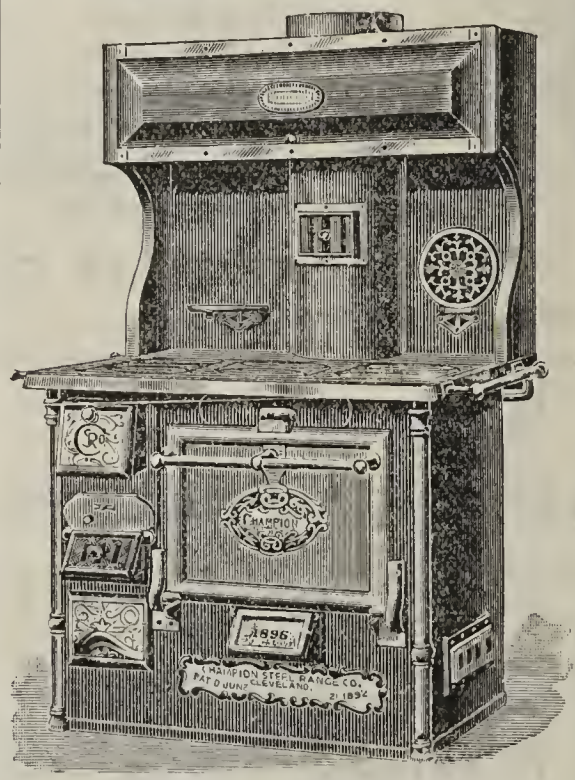
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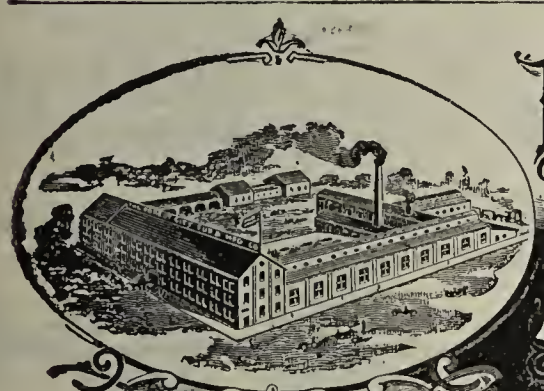
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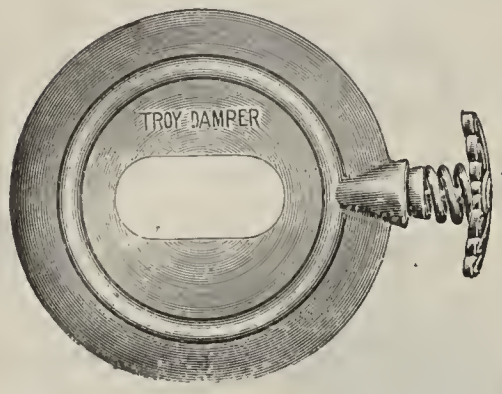
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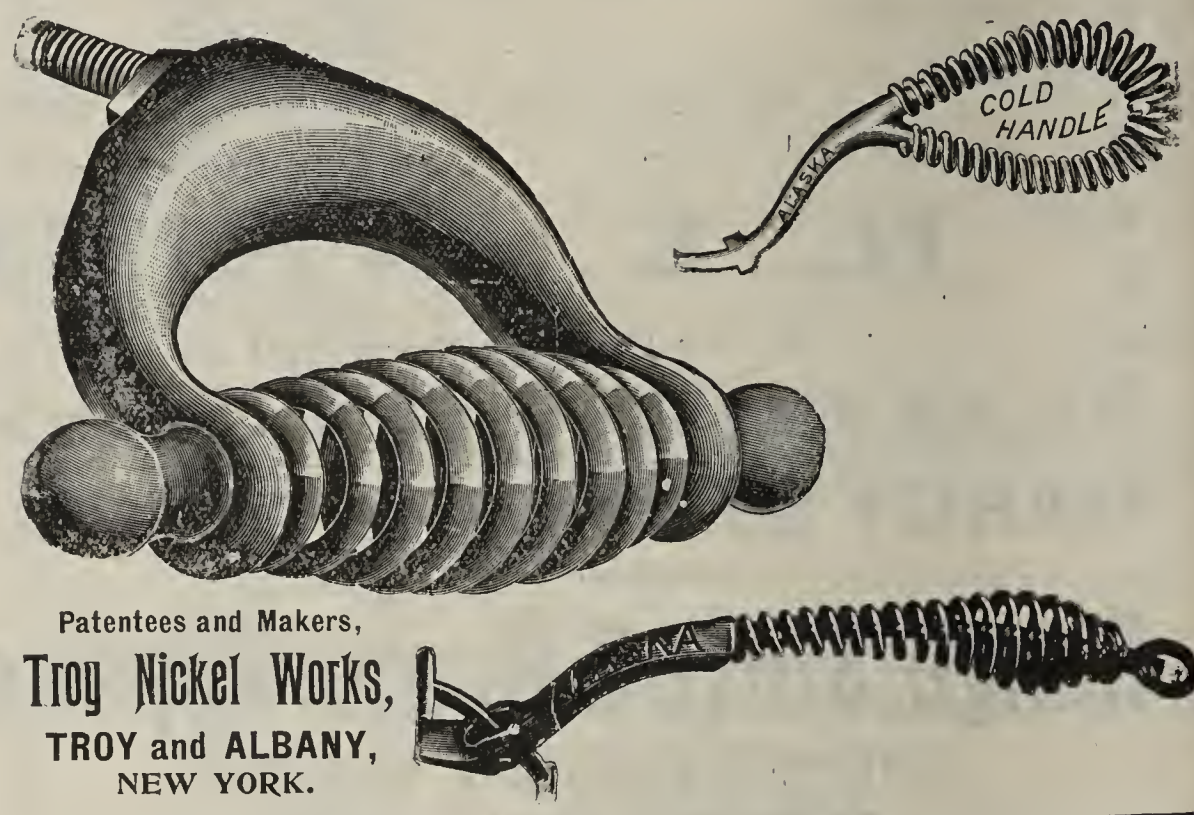
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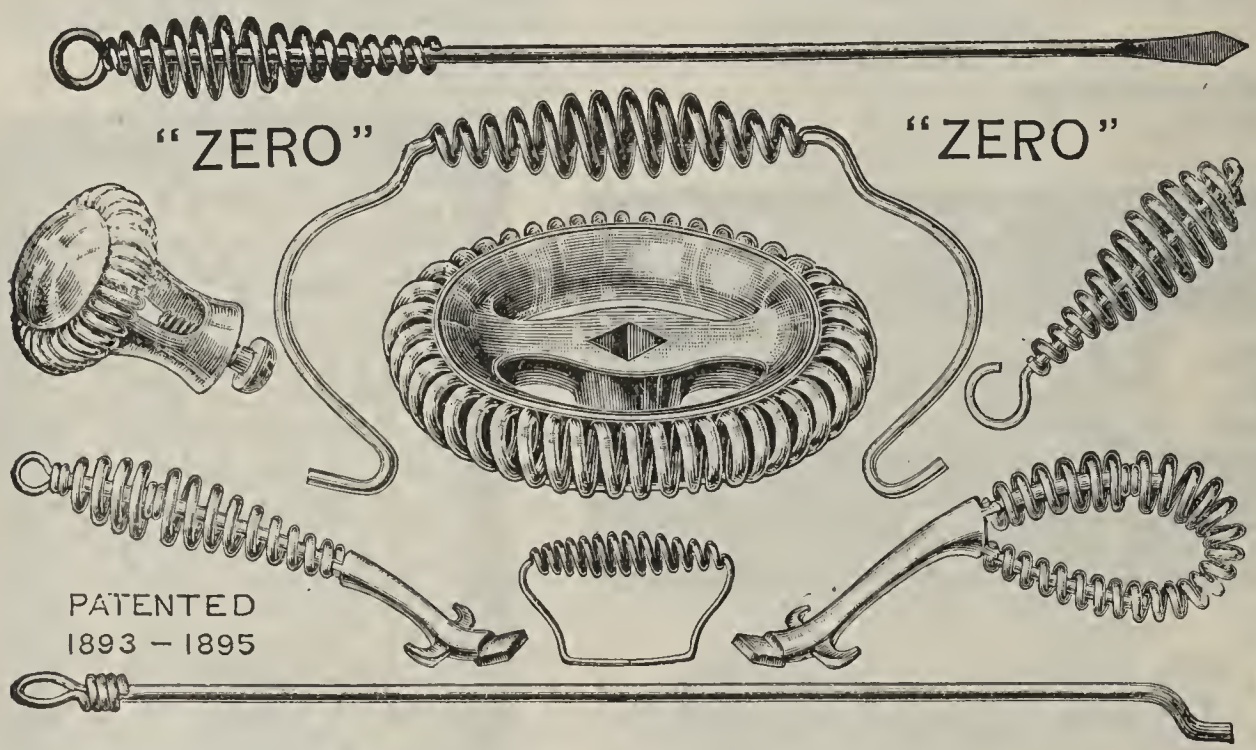


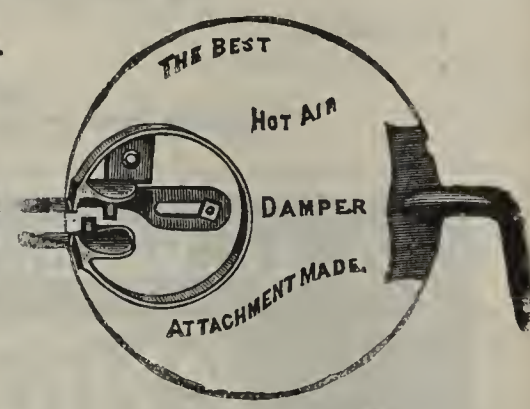
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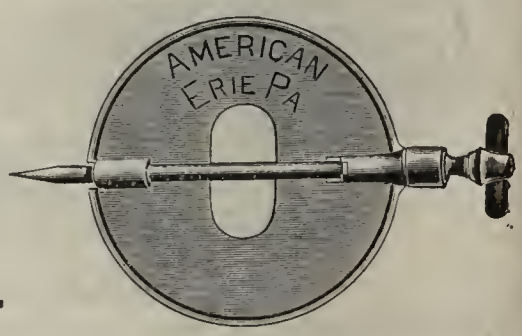
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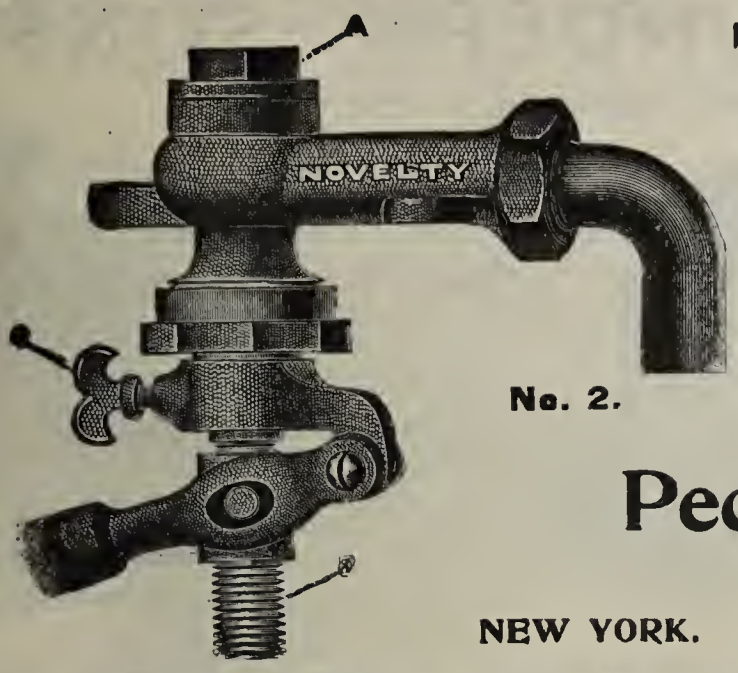
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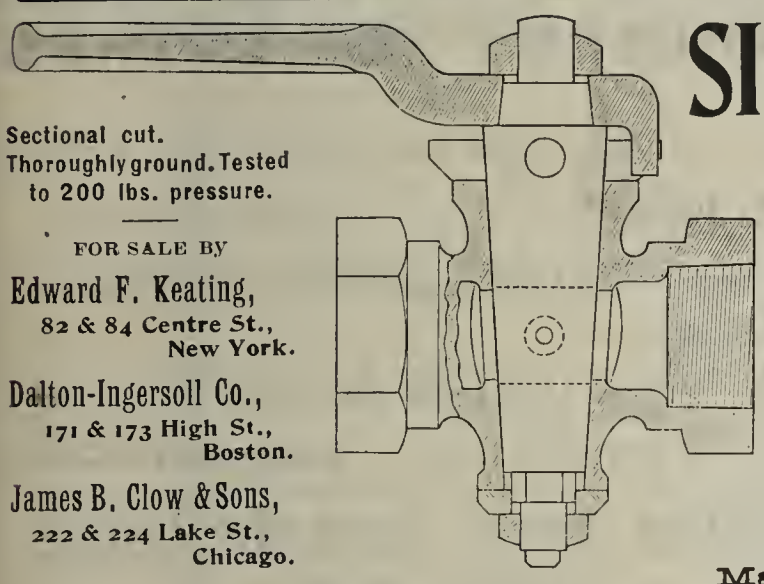
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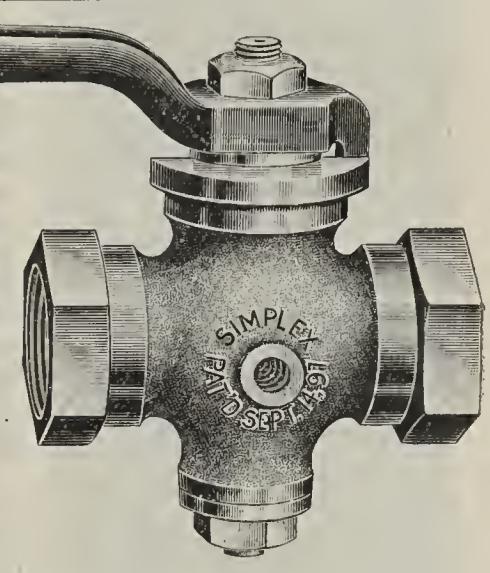
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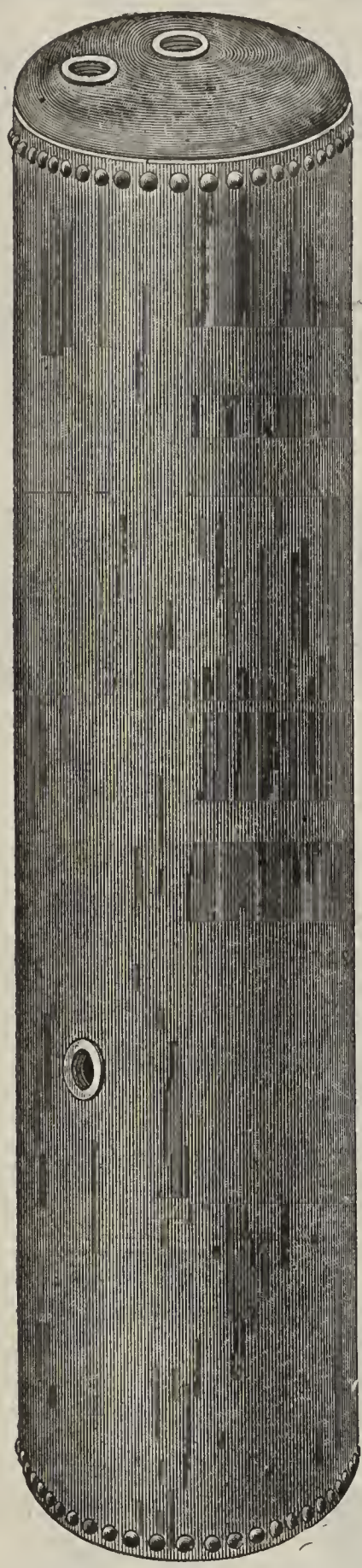
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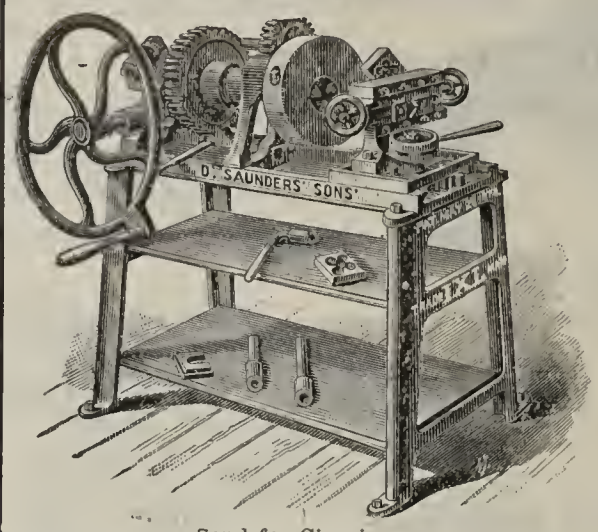
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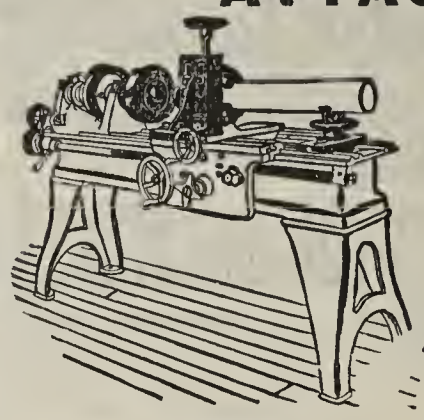
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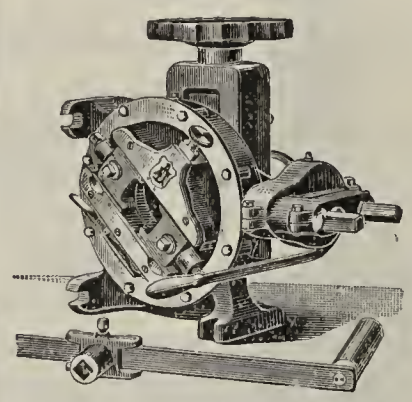
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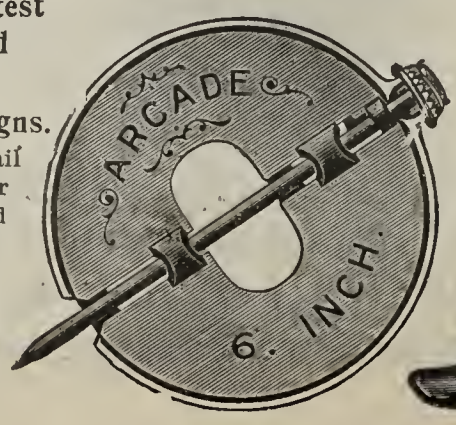
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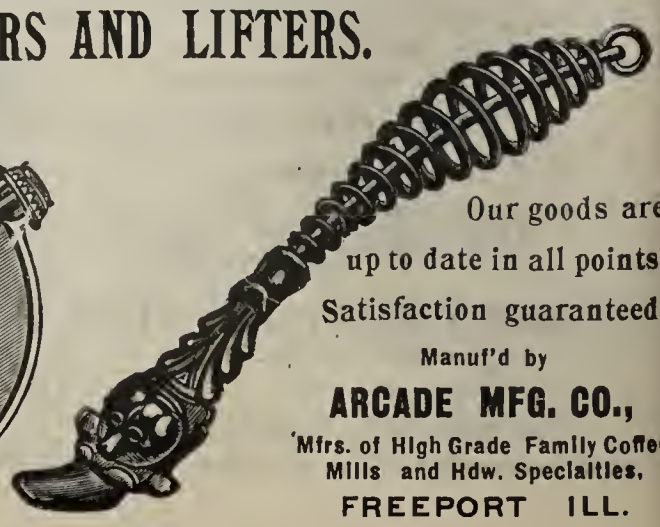
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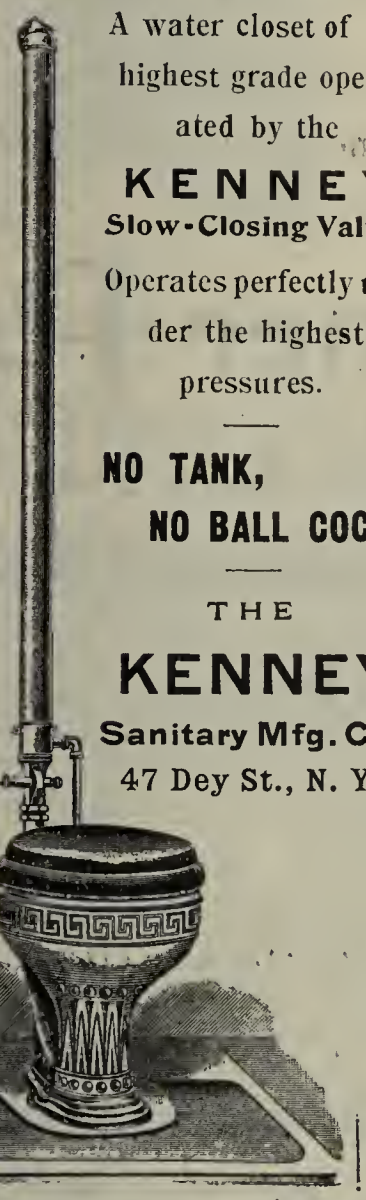
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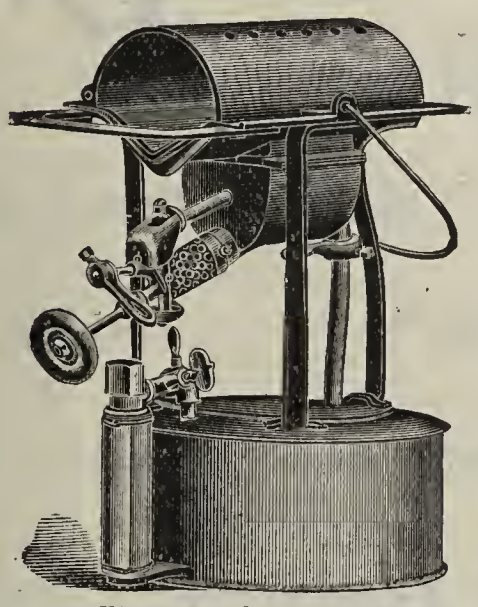
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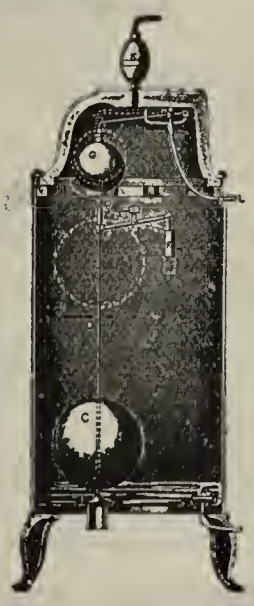


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TABLE OF CONTENTS.

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Introductory,
The Distillation or Manufacture of Coal Gas,
The Distribution of Gas from the Gas Holder Through the Town,
Connecting the Meter in Buildings,
Inspection of Material and Work,
Laying Out Pipe,
Gas Fitters' Tools,
Piping the Building,
Measuring Pipes,
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Gas Logs,
Economical Gas Burning.

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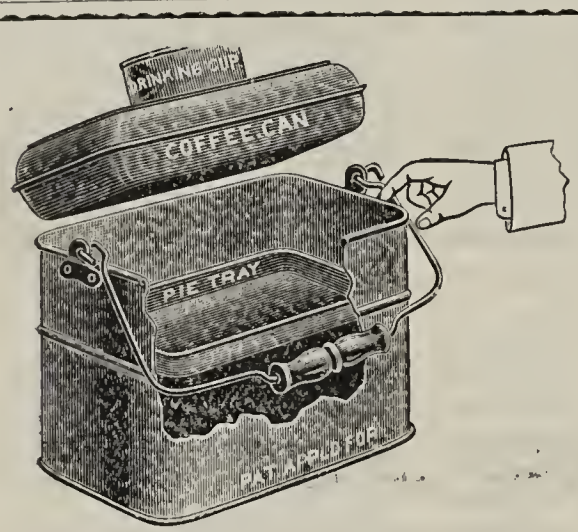
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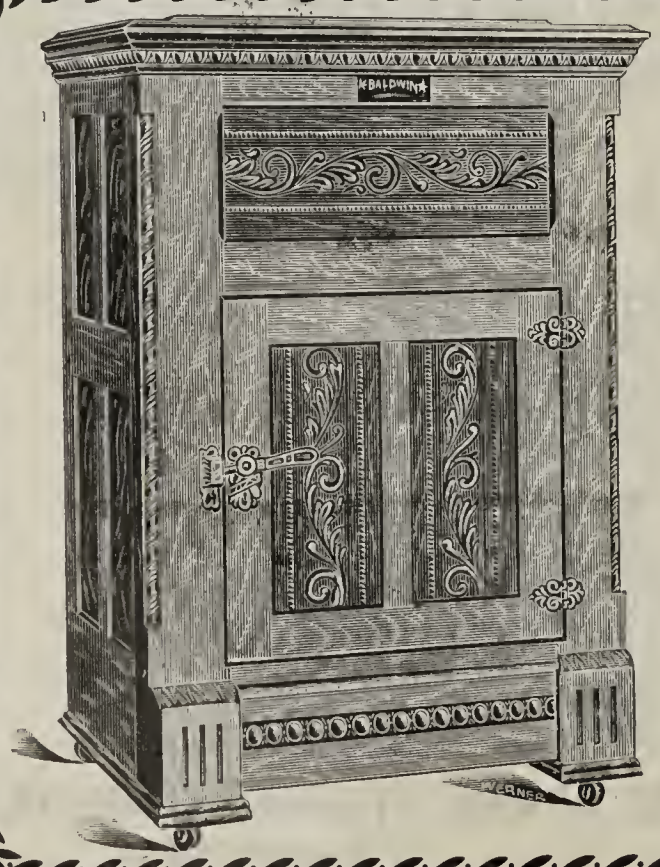
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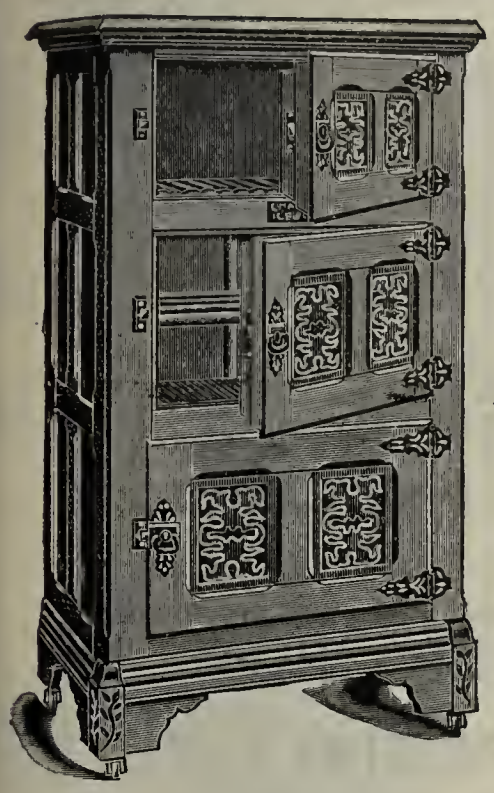
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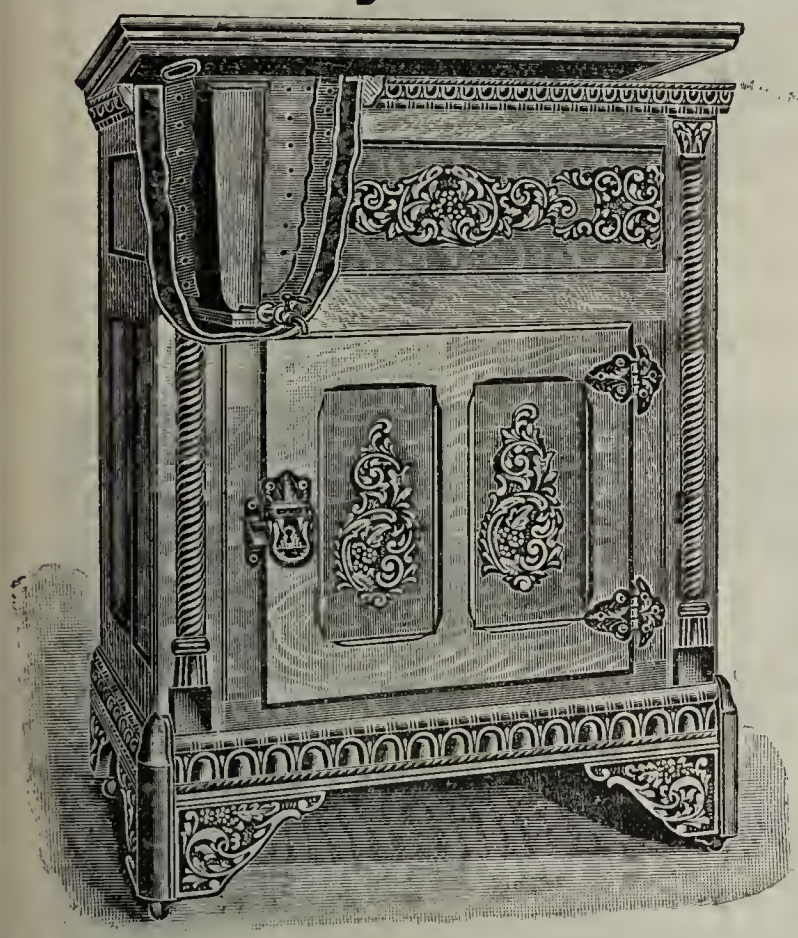
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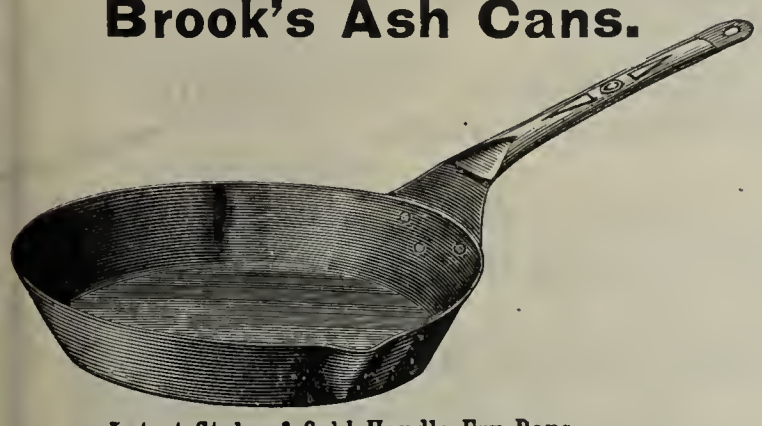
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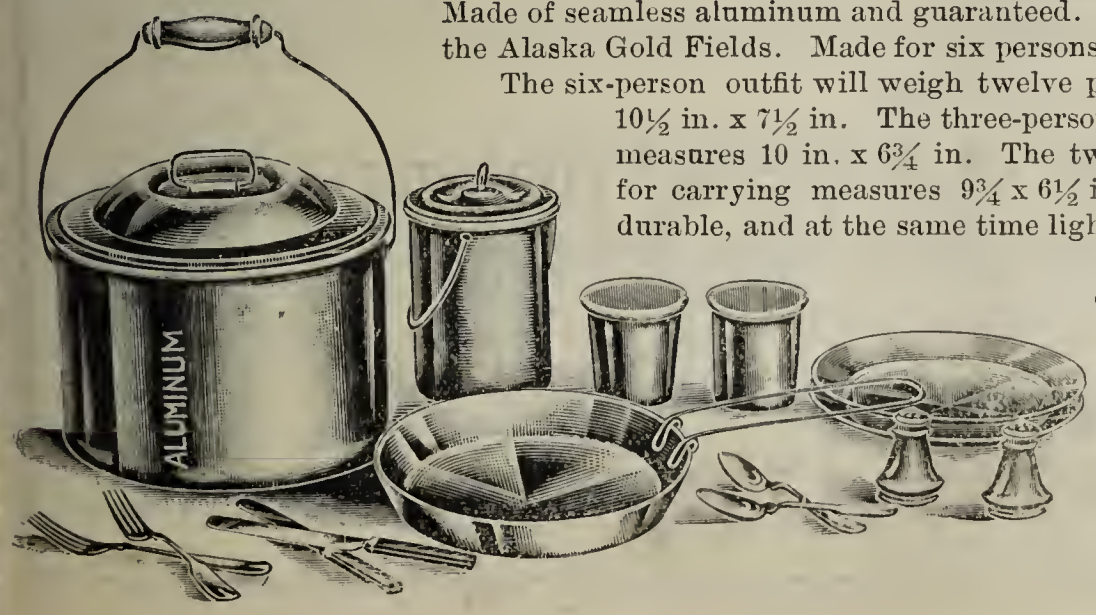
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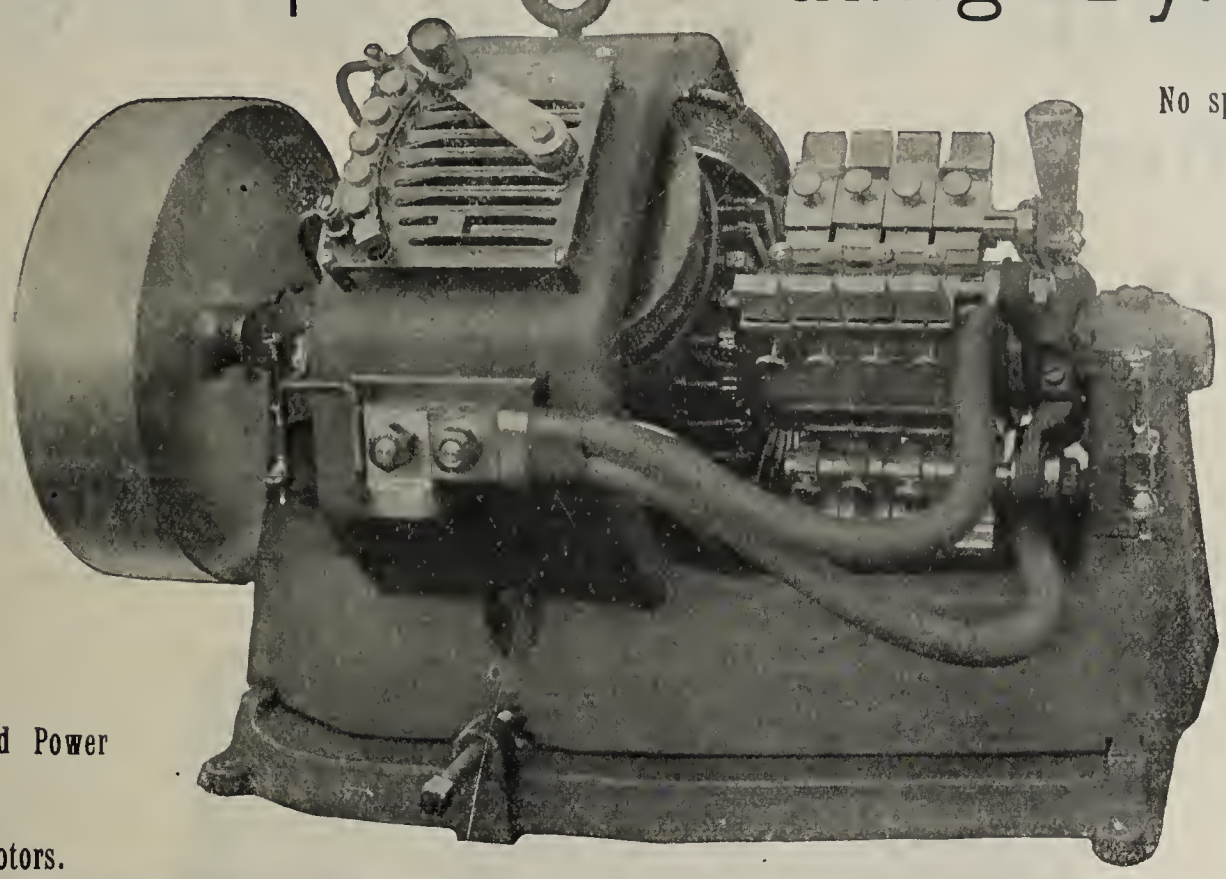
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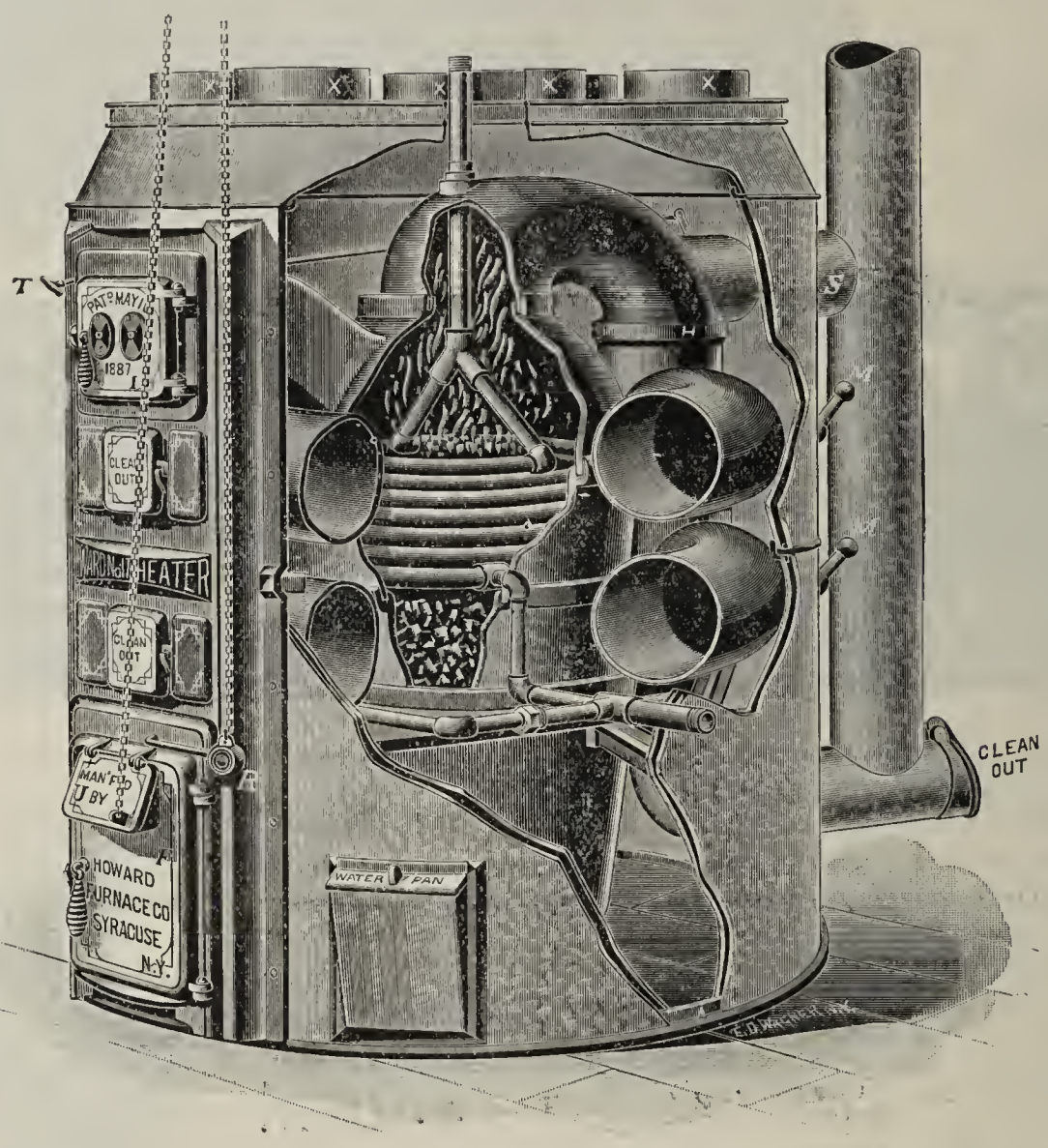
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The Business Situation.

The first week of the new year is not, as a rule, fruitful of noteworthy occurrences in the world of business. Stock taking and the making up of books largely engross the energies of those engaged in trade and commerce. Merchants and consumers are not ready to place new orders for goods until they have measured their requirements by the results of the annual inventory, and the volume of current business, therefore, is apt to be light. The past week was no exception to this rule. Business in general was quiet, and there are few or no changes to record. In the absence of active demand for goods, prices have remained stationary in almost all lines, the principal exception being in the iron and steel trade, where an advance is reported in some forms of finished material, notably in steel billets and wire rods. The metal trade has been dull throughout. In the speculative markets narrow and "professional" trading was the rule, with values somewhat irregular, as is usual while the January settlements are in progress. The tone of nearly all the markets, however, at the close of the week indicated the expectation of an early return of strength and activity. Exports have continued in good volume, and the development of a large and brisk movement of goods at home is looked for as the month progresses. As compared with the outset of 1897 the conditions affecting general business at the present time display a radical change for the better. The distrust and uncertainty which prevailed a year ago have passed away and given place to confidence. Magnificent harvests last year have revolutionized the business situation in the West and the improved status of the community there is reflected in the East also. Long idle mills and factories have been reopened and employment given to thousands of additional workers, so that the opening of 1898 finds the army of labor more fully employed than at any time since the panic of 1893. The railways are making phenomenal strides toward prosperity, in steadily increasing earnings. A number of important railway reorganizations have been effected, and many roads have returned to the ranks of dividend payers. The Treasury gold reserve has swelled to almost unprecedented proportions, reaching about $160,000,000 at the close of the year, and removing all fear of any serious gold shortage for some time to come. The revenues of the Government, too, have begun to show improvement, December's receipts leaving a surplus of $1,736,500 over expenses, the first for a long period.

Business Failures in 1897.

One of the most satisfactory features connected with the business of the past year is the fact that its record of business failures in the United States showed a decided falling off as compared with 1896, alike in number and in liabilities of the individuals or firms succumbing to the pressure of unfavorable circumstances. The figures compiled by *Bradstreet's* place the total business mortality of 1897 at 13,099, a falling off of more than 2000 failures or 13.3 per cent. compared with 1896 and of 15 per cent. from 1893, the first year of the recent business depression. The liabilities of those failing last year make a still more favorable showing. They constitute one of the smallest totals of recent years, amounting to only $156,166,373, a decrease of 37 per cent. from 1896 and of no less than 60 per cent. from 1893. These figures indicate a gratifying return to normal conditions in general business during the year just closed, particularly as the tendency to improvement became more pronounced as the year progressed. The decline in failures, moreover, was general throughout the country, with the exception of the New England group of States, which show an increase of nearly 200 failures and of over $6,000,000 in liabilities compared with the previous year. This poor showing is attributed mainly to the failures of several large cotton mill corporations, which in their collapse pulled down other individuals and concerns with them. The Middle, Western and Northwestern States make excellent showings in the decreased number of commercial embarrassments reported. The Southern States also display improvement over 1896, notwithstanding the depression caused in that section by floods in the early part of the year, the yellow fever scourge in the latter half of the year and a sharp decline in the price of cotton. The total number of Southern failures was the smallest since 1891. A lesser decrease both in failures and in liabilities is shown by the Pacific Coast States, while the Territories had a slight increase in the number of failures, but a decline of about 60 per cent. in the liabilities of those failing.

The 1897 Fire Losses.

The past year was one of the most satisfactory from the point of view of the fire insurance companies that they have ever experienced, for a combination of increased rates and reduced losses made their profits more liberal than in several years past. The increased efficiency of urban fire departments and improvements in fire fighting appliances, together with the better precautions taken against fire in modern buildings which have come in during the past few years, are reflected in a steady decline in losses from this cause, notwithstanding the growth of population and the increase which has taken place in the number of buildings. According to the figures published by the New York *Journal of Commerce*, the total fire

losses of the United States and Canada for 1897 amounted to $110,319,650, a large enough sum, it is true, but smaller by $5,000,000 than the losses for 1896, and $19,500,000 below the 1895 figures. Several very large fires swelled the total for last year, there being no less than 22 cases where the loss exceeded half a million dollars. Otherwise the figures would have been more favorable than they are. But the fact that the losses in smaller fires were very much less in amount than in previous years is gratifying, and speaks well for the improvement which is taking place in the matter of fire protection. The most notable fires of the year were the burning down of a dry goods store and a number of business houses in Pittsburgh, Pa., with a loss of $2,300,000 ; the destruction of railroad piers and shipping property at Newport News, Va., involving a loss of $1,500,000 ; of a large dry goods store at St. Louis, Mo., with $1,300,000 damage; of several business buildings at Knoxville, Tenn., at a loss of $1,000,000, and a destructive fire at Windsor, N. S., which did a damage of $1,250,000. Besides these seven large conflagrations at Philadelphia, Harrisburg, Pa.; Hoboken, N. J.; Washington, D. C.; Detroit, Mich.; Grand Forks, N. Dak., and Chicago, each accounted for a loss of $750,000 or over. Among the notable structures destroyed by fire last year were the Pennsylvania State Capitol Building at Harrisburg, the Coliseum Building at Chicago and the Immigration Bureau buildings at Ellis Island, New York City. Two fires of extraordinary destructiveness occurred abroad during the year, one in London, England, and the other in Melbourne, Australia, each involving many millions of dollars of loss, and each destroying a large area in the business centers of those cities. The antiquity and inefficiency of the fire fighting methods in both London and Melbourne, as compared with the systems in vogue in this country, were strikingly illustrated in these disasters.

The Philadelphia Exposition of 1898.

A charter has been issued to the Philadelphia Exposition Association, a corporation who are to manage the affairs of the Exposition of Manufacturers of the United States to be held in Philadelphia next October under the joint auspices of the Philadelphia museums and the Franklin Institute of that city. The incorporators, who will also form the first Board of Directors, are P. A. B. Widener, who will be the president of the association; William L. Elkins, John Birkinbine, John H. Converse, Edwin S. Cramp, Thomas Dolan, Dr. William Pepper, Mrs. Sara Yorke Stevenson, A. B. Farquhar, W. W. Foulkrod, J. C. Strawbridge, William P. Wilson, Daniel Baugh, Sydney L. Wright, Joseph S. Harris, Louis J. Matos, William M. Watts, Wilfred H. Schoff, John R. Savage, C. A. Green, G. H. Leaf, A. Sydney Millward, Henry C. Corfield, E. H. Barclay and Arthur Brock. The working force of the organization will be organized immediately, and all preparations pushed forward with vigor. It is intended to erect a main building on ground in West Philadelphia donated by the city to the Philadelphia Museums for the erection of permanent buildings. The main building will be constructed in such a manner that it may be subsequently used for the Philadelphia Museums. Other temporary buildings will be put up also The capital stock with which the association starts is placed at $300,000.

A statement prepared by the Navy Department at Washington places the property value of the various navy yards and naval stations of the Government at over $60,000,000, of which $54,000,000 represents the value of real estate and chattels and $7,000,000 that of machinery. The navy yard at New York is estimated to be worth a little more than $16,000,000 and that at Boston between $10,000,000 and $11,000,000. The Norfolk Navy Yard is valued at $6,000,000 and that at Mare Island at $5,500,000. The ordnance factory at Washington is valued at $7,000,000. including plant and everything complete for the manufacture of great guns. The League Island Navy Yard is estimated to be worth $3,500,000; the Portsmouth yard, $3,100,000; that at Pensacola $2,000,000, and the new naval station at Puget Sound $800,000, while the valuation of the Naval Academy grounds is placed at about $800,000.

Changes in the Patent Laws.

Howson & Howson of Philadelphia have issued the following statement with reference to the important amendments recently made to the patent laws :

1. A radical change is made in Section 4887 of the Revised Statutes, affecting the interests of those taking out, or desiring to take out, foreign patents. The section, as revised, reads as follows (the new parts being printed in brackets):

"Sec. 4887. No person [otherwise entitled thereto] shall be debarred from receiving a patent for his invention or discovery, nor shall any patent be declared invalid, by reason of its having been first patented or caused to be patented [by the inventor or his legal representatives or assigns] in a foreign country [unless the application for said foreign patent was filed more than seven months prior to the filing of the application in this country, in which case no patent shall be granted in this country]."

It will be seen that the long standing requirement that "every patent granted for an invention which has been previously patented in a foreign country shall be so limited as to expire at the same time with the foreign patent" will be abolished, so that all patents granted under the new law will run for the full term of 17 years. Furthermore, under the new law, an inventor can apply for his foreign patents without waiting for the allowance of his U. S. application, or arranging for the issuance of his U. S. patent. In fact, he can file his foreign applications simultaneously with, or even before, the filing of his American application. On the other hand, there has been added a limitation, whose practical effect will be to cause a foreign patentee to forfeit his right to a U. S. patent unless he shall file his American application within seven months after the filing of his foreign application.

2. A new defense can be set up to an action for infringement of a patent granted under the new law, namely : "That it (the invention) has been patented or described in some printed publication . . . more than two years prior to his application for patent therefor." Such two years' prior publication or patenting of an invention will bar the grant of a valid patent for the invention under the new law. (Sec. 4886 and Sec. 4920, R. S.)

3. Under the law as amended, the time within which an applicant for a patent is required to proceed with his application in the Patent Office is reduced from two years to one year after any official action thereon. (Sec. 4894, R. S.)

Note.—The act provides that the above-mentioned amendments "shall not apply to any patent granted prior to January 1, 1898, nor to any application filed prior to said date, nor to any patent granted on such an application."

4. The act of March 3, 1897, also put in force a Statute of Limitation, as follows :

"But in any suit or action brought for the infringement of any patent there shall be no recovery of profits or damages for any infringement committed more than six years before the filing of the bill of complaint or the issuing of the writ in such suit or action, and this provision shall apply to existing causes of action." (Sec. 4921, R. S.)

A Public Accountant.

An innovation has been made by the American Tin Plate Company of Chicago in employing a public accountant to certify the correctness of the calculations in their recently published ratio and code book. George Wilkinson, whose certificate appears in the ratio book, is an Englishman, and the son of an accountant. His first experience in this country was in January, 1887, with the old established firm of Veysey & Veysey, public accountants, New York. After a trip to China, to remodel the accounting of a large trading concern in Shanghai, he was engaged in March, 1890, by the well known firm of chartered accountants, Barrow, Wade, Guthrie & Co., and was placed in sole charge of their Chicago branch. In this responsible position he remained until April 1 last, when he began to practice in his own name with offices in the Royal Insurance Building, Chicago, and in the Johnston Building, New York.

A new law, which went into effect on January 1, limits the production of goods in the workshops of the Massachusetts penal institutions, so that not over 30 per cent. of the inmates of any one prison shall be employed in any single industry, except cane seating and the manufacture of umbrellas.

THE LETTER BOX.

Capacity of a Centrifugal Pump.

From A. G. Adelman, Boise, Idaho.—I would like to know if I could get a description or name of a pump that will draw water 100 feet vertically and discharge 50 miners' inches continually, and what would be the necessary horse-power to run it smoothly. I have a centrifugal pump that has a 4-inch discharge and would like to know if it could be used to do the work advantageously and the necessary horse-power to run it.

Answer.—We will be glad to have pump manufacturers send word to Mr. Adelman of the pumps they make that meet his requirements. It will require, theoretically, 15 horse-power to raise 50 miners' inches of water (75 cubic feet) per minute to a hight of 100 feet. The friction of pump and water in pipe will require about 5 horse-power additional, or, say, 20 horse-power in all. If you are to draw the water from a deep well a deep well pump must be used, the lifting bucket of which must be located at the natural water level of the well, so that when the water level falls by pumping the suction distance may not exceed 25 feet at any time. A centrifugal pump cannot be used for deep wells nor for a hight of 100 feet. The speed required is very great, with no economy as to power. If the well is an open one in which a direct acting steam pump can be placed within 20 feet of the surface of the water, it will be the best and most economical method of pumping. If it is a bored deep well a vertical direct acting lift pump, with the bucket chamber well down below the water line, is the best method. In either case a 20 horse-power pump and boiler will be required. If nearby power can be obtained conveniently for compressing air the Pohlé air lift system may be applied to a deep bored well to great advantage and it requires no attention whatever at the well. The operation of the compressor at the power house requires but little attention from the engineer.

Asbestos Lined Portable Sheet Iron Stove.

From W. T. Twitmire, Bellefonte, Pa.—Is there such a thing as a sheet iron stove with asbestos lining and made so that it can be taken apart and packed in a small space? I have an order for some for the Alaska mining country and would be glad if *The Metal Worker* or some of its readers would tell me if there is such a stove and where I could get it.

An Explanation of Hood's Tables.

From T. H., N. Y.—On page 471 in Hood's book on heating and ventilation, edition of 1894, I find that a difference of temperature in a ventilating flue of 5 degrees (flue 10 feet high) gives a velocity of 116 feet per minute, as I understand it. In table of velocity of chimney drafts, external air 32 degrees and temperature of warmed air 86 degrees, a difference of 54 degrees, the relative velocity is represented as 4.93. There seems to be no explanation and I cannot understand it, though I suppose it will be all clear when the proper key is applied.

Answer.—We submitted the above inquiry to Prof. J. H. Kinealy of Washington University, St. Louis, Mo., who furnishes the following comments: The first table referred to, that on page 471 of Hood's book, gives the velocity in feet per minute of the air entering or leaving the shaft, and is calculated upon the assumption that about one-quarter of the total draft head is lost in friction. It is also supposed that the air does not change in volume in the shaft; the volume that enters at the bottom per minute is the same as the volume that leaves at the top per minute. The formula used is

$$v = 16\,45\ \sqrt{h\,(t_1 - t_2)}$$

v is the velocity in feet per minute of the air in the shaft; h is the hight of the shaft in feet; t_1 is the temperature of the air outside, about 32 degrees F.; and t_2 the temperature of the air in the shaft, which is supposed to be about the same as that of the air in the room; $t_1 - t_2$ is what is called, in the table, "excess of temperature of air entering the ventilating shaft above the external air."

The second table, entitled "Velocity of chimney draft at different temperatures, the external air being at 32 degrees F.," gives the velocity in feet per second of the cold air entering the chimney. In making this table it was supposed that a pound of the cold air entering the furnace at the base of the chimney and a pound of the hot gases flowing out the top of the chimney would occupy the same volume if reduced to the same temperature, and that the area of the opening for the entrance of the cold air into the furnace is the same as that of the smallest cross section of the chimney. The velocity of the entering cold air may be much less than that of the escaping hot gases, because the air is heated in the furnace, and therefore occupies a much greater volume in the chimney than it did outside, and the volume of gas that flows out of the chimney per second is much greater than the volume of cold air that enters per second. To illustrate this, let us determine the number of cubic feet of cold air at 32 degrees F. that must flow into a furnace per second in order that 10 cubic feet of hot gas at 320 degrees F. may flow out the chimney per second. Upon the assumption that the cold air and the hot gases will have the same volume at the same temperature, it is evident that the volume of cold air at 32 degrees F. that must flow into the furnace per second is equal to the volume that would be occupied by 10 cubic feet of gas when cooled to 32 degrees F. from 320 degrees F. The volume that would be occupied by the 10 cubic feet of gas, if cooled to 32 degrees F., is

$$\frac{10\ (461 + 32)}{461 + 320} = \frac{10 \times 493}{781} = 6\ 31 \text{ cubic feet.}$$

That is, only about 6.3 cubic feet of cold air enters the furnace at the base of the chimney for every 10 cubic feet of hot gases that goes out of the top of the chimney. Therefore the velocity of the entering cold air is but about 0.63 of the velocity of the hot gases escaping from the top of the chimney. I think that the table is intended for chimneys between 15 and 20 feet high, and is calculated upon the supposition that about one-half of the total draft head is lost in friction. The formula used in calculating the table is, probably,

$$V = \frac{368\ \sqrt{t - 32}}{461 + t}$$

V is the velocity in feet per second of the entering cold air, and t is the temperature in Fahrenheit degrees of the gases in the chimney.

Barn Roof Sweats.

From E. G. Washburne & Co., New York City.—In *The Metal Worker* of December 18 is a letter from "M. B.," Baraboo, Wis., giving an account of the condensation on the under side of a barn roof. We would state that a rotary ventilator in the roof would prevent the moist air from accumulating under the roof to leave a deposit in the form of water. We use a great many ventilators for this class of work and have just completed a job on a brewery at Elizabeth, N. J., where the vapor and steam from the malt is successfully cleared from the building.

SHEET METAL WORK.

SLATE AND COPPER ROOFING ON FIRE PROOF BUILDINGS.—V.

BY WILLIAM NEUBECKER.

SLATING IN COPPER DORMER OR BULL'S-EYE.

Fig. 24 shows the method of placing flashing around a bull's-eye dormer, previous to slating in the roof. We will assume that the slating has been carried up as far as shown by the dotted line F. Let K represent the window opening and A the copper curved molding, over which the copper roof J is placed in the shop, cut to the required pitch. G is the flange formed direct to the sill S, and connected, as shown, to the 8-inch flashing H, which is soldered firmly and water tight to the roof J. A water lock starting at L all around the flashing at M and N is made

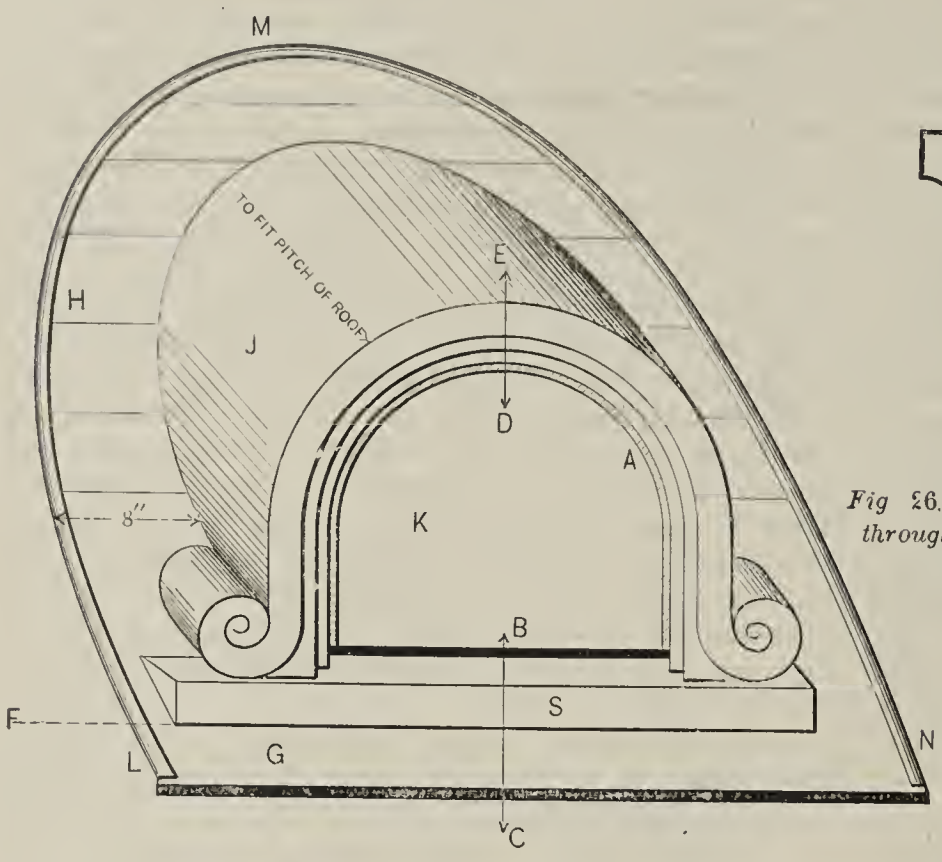


Fig. 24.—Showing Method of Flashing Around Bull's-Eye Window

the metal sill shown at G. The wooden sill N, which has a corresponding rabbet, J, cut into it to fit over the metal rabbet G, is set over the copper sill and forms a water tight joint. Likewise in Fig. 26 is shown an enlarged section through D E in Fig. 24, showing the method of obtaining a water tight joint between the copper molding and wooden sash. Let A, Fig. 26, be the copper molding, having a flange attached as shown at B, indicated in Fig. 24 at A. C, Fig. 26, represents the wooden sash on which the flange B is nailed and then covered by means of the wooden molding F, which makes a water tight joint.

FASTENING RIDGES ON FIRE PROOF ROOFS.

Let A A in Fig. 27 represent the roof beams, on to which the angle iron are bolted and filled with fire-proofing, as

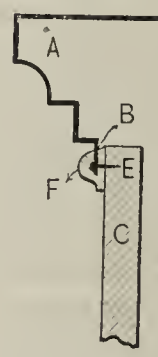


Fig 26.—Enlarged Section through D E in Fig 24.

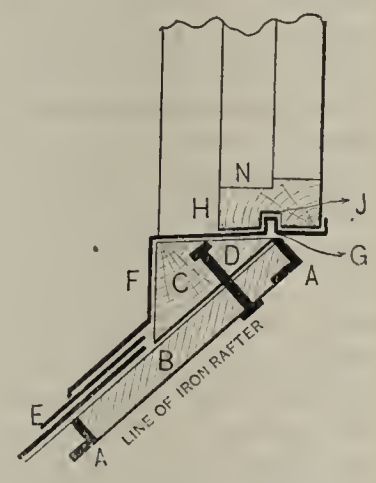


Fig. 25 —Enlarged Section through B C in Fig. 24.

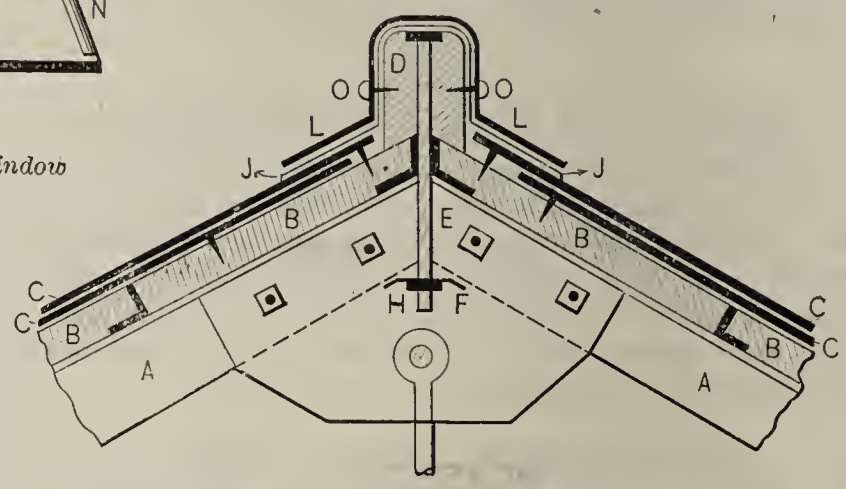


Fig 27.—Section through Ridge and Copper Covering.

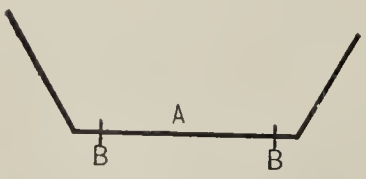


Fig. 28.—Clamp with Ends Bent.

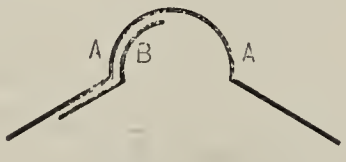


Fig. 29 —Brass Clamp and Iron Model

as shown. The window being prepared in this manner, it is now set over the slate line F and the slating continued around the roof J, which makes a water tight finish.

Fig. 25 is an enlarged view through B C in Fig. 24, showing the method of obtaining a water tight joint between the copper and wooden sill of the window. A A in Fig. 25 represent the angle irons on which the terra cotta blocks are laid, the wooden sill C being bolted as at D by the framer through the blocks. The wooden sill is cut to correspond in size and shape to the copper sill S in Fig. 24. The sill C, Fig. 25, being in position, let E be the last course of slate butting against the wooden sill C ; the copper sill F H is now placed over the wooden sill, with the flange covering the last course E and a rabbet formed in shown at B B, &c. C C show the slating butting against the wooden ridge roll D, which is placed in position by the framer, by means of the bolt E, and fastened at the inside by means of a washer and nut. J J show the copper ridge, which is placed over D, flashing over the slates and covering the nail heads. To prevent the wind from tearing up the ridge roll, brass clamps L L made of 3-16 x 1¼-inch band brass are placed over the copper ridge and fastened by brass screws O O.

If a number of changes are to be made to fit the ridge, the first step is to get the required stretchout, cut off all the lengths of brass, punch and countersink the holes, so that they will come in the position shown at O O, and bend the flanges at their proper angles, as shown in Fig. 28, in which B B are the holes, countersunk on the side

A. The clamps being made of soft brass, they are bent cold, using a little device shown by B in Fig. 29. In the shop it is called a gauge and is made of ¼ x 1¼ inch band

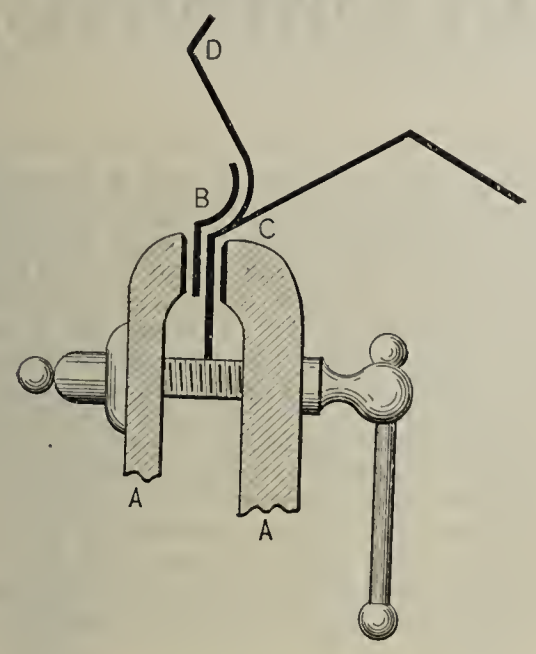


Fig 30—First Operation in Bending Clamp

iron having the required angle and one-half the profile of the ridge.

In Fig. 30, A A is a vise, B the iron gauge above referred to and C the brass clamp with angles already bent. Draw over the clamp C into the position shown by D for

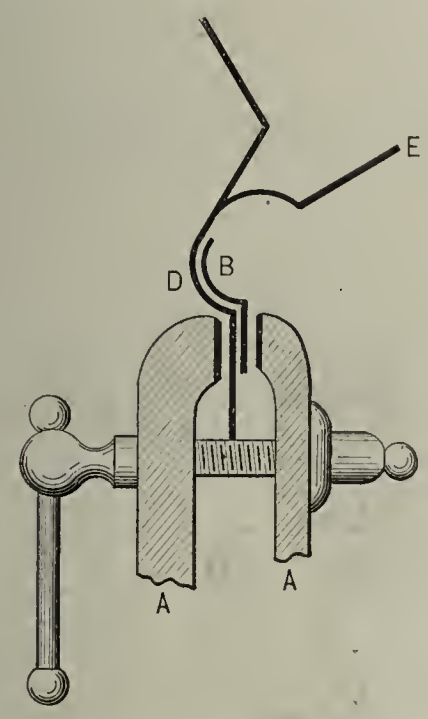


Fig. 31.—Second Operation in Bending Clamp.

the first operation. The second operation is shown in Fig. 31, in which D is the partly finished clamp, which is drawn over by hand to the position shown by E.

FLASHINGS.

James A. Coe & Co., Newark, N. J., send a New Year's greeting to their friends in the trade on a prettily decorated postal card.

The Newport Rolling Mill Company, Newport, Ky., manufacturers of Steel and Galvanized Sheets, advise us that they put out the largest tonnage in 1897 that they have ever had since the mill was started. Two new mills were added to their equipment during the year and the whole plant ran most successfully for 48 weeks, with fewer breakages and accidents than in any previous season. The company are looking for a larger and more profitable business in the present year than ever before and are amply prepared to meet it.

Joseph F. Annear, formerly of the firm of Carpenter, Annear & Co., but lately superintendent of the Bourlier Cornice & Roofing Company, Louisville, Ky., died in that city after a brief illness December 27, his death being due to a carbuncle. Mr. Annear had been in the cornice and roofing business in Louisville for the past 27 years, and was very highly esteemed by all who knew him for his kindness and integrity. Out of respect to his memory the Bourlier Cornice & Roofing Company closed down their works and attended his funeral in a body, the interment being in Cave Hill Cemetery. He leaves a widow and two children.

A finely colored print of a brook trout in the process of being taken from his home is the decorative feature of an attractive calendar distributed by George B. Blizzard, tin and sheet iron worker, 108-110 Manton street, Philadelphia, Pa. Other work done by Mr. Blizzard includes erecting and repairing Heaters and Ranges, Galvanized Iron Work, Blast Pipes, &c.

David Lupton Sons, 2613 Coral street, Philadelphia, Pa., have recently completed the sheet metal work on Piers 22 and 24, South Wharves, Philadelphia. These piers are 100 feet wide and 500 feet in length. In addition to the Corrugated Galvanized Iron Siding used, which amounted to three carloads. there were 54 Skylights having ½-inch glass and 28 36 inch Star Ventilators. The firm now have the contract for similar work on Pier 25, North Wharves. The firm also make a specialty of the manufacture of Conductor, Eave Trough and Conductor Elbows, Shoes and Fittings. They have recently added to their well equipped factory a galvanizing department, enabling them to galvanize Sheet Metal Work, which they manufacture, and also to do galvanizing for the trade.

The stock of the Iron City Mfg. Company, manufacturers of Steel Ceilings, whose works are located at Twenty-third and Mary streets, S. S., Pittsburgh, has been purchased by Jno. C. Graff of the Graff Roofing Company of Pittsburgh, who will reorganize the business of the Graff Roofing Company and Iron City Mfg. Company under the charter of the latter concern, and the name retained will be Iron City Mfg. Company, of which Jno. C. Graff is president. The new company will manufacture all kinds of Iron and Steel Roofing, Metal Shingles and Steel Ceilings, and will be pleased to have the inquiries of the trade.

The Vinton Steel Works, manufacturers of Sheet Steel Ceilings and other sheet metal specialties, who have lately been reorganized, with several new stockholders, elected the following officers recently: President, S. E. Keith; vice-president. J. B Sanders; secretary, S. H. Metcalf; treasurer, Matt. Gaasch. The company, it is reported, will put in considerable new machinery, and with the aid of the new capital will be able to push the business on a much more extended scale.

A very neat calendar has been received from the Boss Tin Shop, Bonaparte, Iowa. It is destined to be hung on the wall, having a good sized cardboard back, embossed in gilt and enlivened by a taking picture of three kittens.

The partnership lately subsisting under the name of W. Austin Obdyke & Co., Philadelphia, expired on December 31, 1897. The business will be continued by Benjamin P. Obdyke.

The annual meeting of the stockholders of the Simmons Hardware Company, St. Louis, was held Monday, January 3, and the election of officers resulted as follows: President, Wallace D. Simmons; first vice-president, J. E. Pilcher; second vice-president, H. M. Meier; third vice-president, J. E. Smith; fourth vice-president, S. Norvell; traffic manager, F. N. Johnson; treasurer, A. E. Dann; assistant treasurer, G. R. Barclay; Secretary, A. W. Douglas; assistant secretary, E. H. Simmons; Advisory Board: E. C. Simmons and I. W. Morton.

Arthur Howes of Weymouth, Mass., has devised a collapsible house of aluminum, for the use of prospectors in the Klondike. The roof and walls are made of sheet aluminum 1-32 inch thick and the frame is of cold drawn steel bicycle tubing. Its interior dimensions comprise 180 cubic feet of space, and the house complete. when packed for transportation, weighs only 110 pounds. An order for a large number of these houses is reported to have been placed at Pittsburgh. They are to be shipped to Seattle as fast as completed.

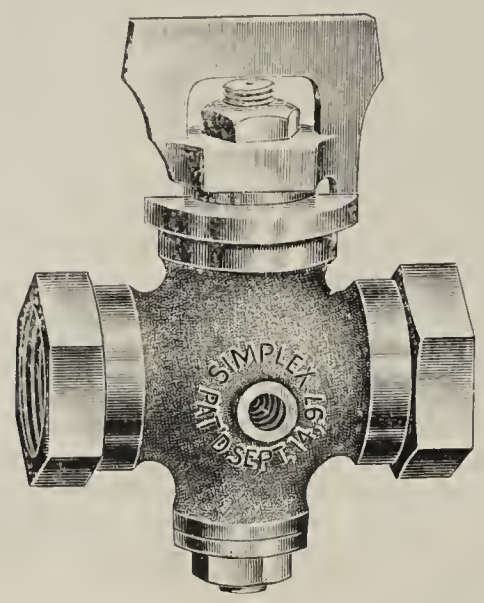
Secretary Long of the Navy has asked permission from Congress to consolidate a number of naval appropriations, aggregating $54,000, with the idea of building a 5000 ton coal shed at Key West, Fla. The project is the first step toward making Key West a naval rendezvous It is proposed to put up a fire proof structure containing appliances for coaling vessels by the most economical and rapid mechanical means.

A decision of great interest to the users of natural gas was handed down this week by Judge Fox in the Wayne County Circuit Court of Indiana. Charles H. Glawson brought suit to enjoin a company from cutting off his supply of gas because he refused to comply with a new order of the company fixing one price for gas used for heating and another price for that used for illuminating. Judge Fox held that the company must make their rate uniform.

HEATING AND PLUMBING.

The Simplex Stop and Waste Cocks.

In the accompanying illustrations we show the Simplex stop and waste cocks made by Landers, Frary & Clark, New Britain, Conn. The stop cock is made of steam metal, thoroughly ground and tested to 200 pounds pressure. Special attention is called to the character of the castings, and the proportion of the cock is said to provide strength where it is needed to stand the strain. A general view is presented in Fig. 1 of the cock arranged to be opened with a key or wrench. Fig. 2 is a sectional view showing the construction and a lever attachment for use when the cock is placed where it is readily accessible. Fig. 3 is a view showing the cock without the lever for operating it, and showing a stud on the key which is directly over the waste hole in the key and arranged to limit its motion to one-half of a circle. It is pointed out that by simply changing the lever to operate the key from one side to the other the cock may be made a right or left hand cock, as desired. By this means it is impossible to set the cock wrong, as the lever will be parallel with the pipe when it is open and at right angles when it is closed. When it is closed and the lever at right angles the waste opening in the key will always correspond with the waste opening in the cock. With the pressure of water from the service pipe closed off this will allow the water in the piping on the other side of the cock to waste away.



The Simplex Stop and Waste Cock.—Fig. 1.—General View of the Cock.

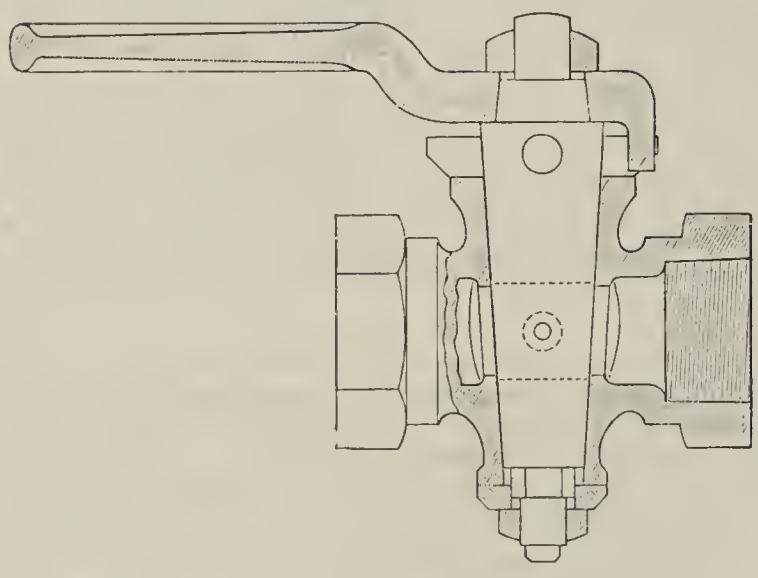


Fig. 2.—Sectional View.

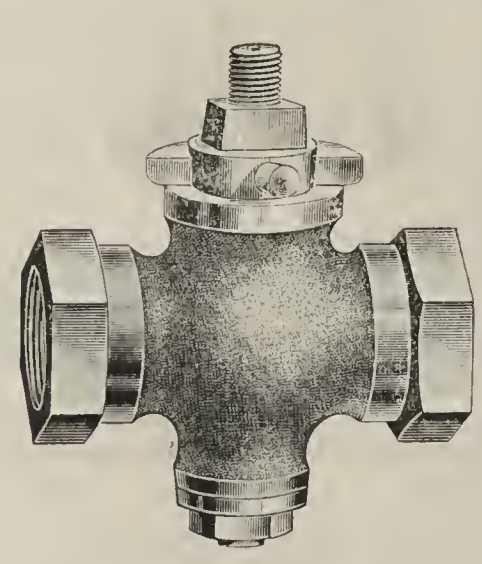
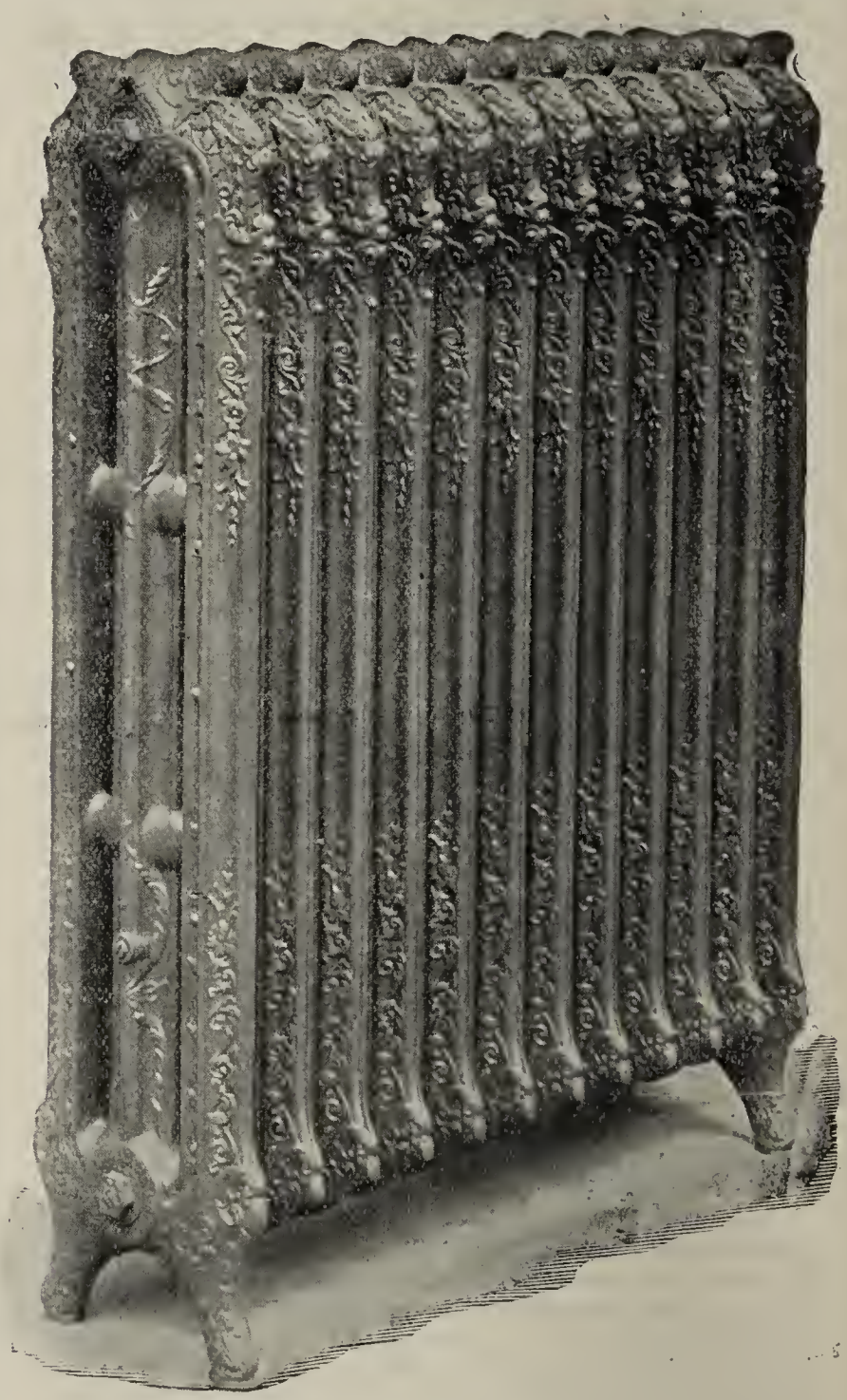


Fig. 3.—Showing Spud, which Denotes the Location of the Waste Hole in the Key.

The Touraine Radiator.

In the accompanying illustration we show the new radiator made by the International Radiator Mfg. Company of Cheektowaga, N. Y., and for which Fred. D. Johnson, 86 Centre street, New York City, is the general sales agent. The radiator is of the three column type, 2½ inches from center to center, containing 5½ feet per loop, and 38 inches high. A special feature of the radiator is its open form, allowing a free entrance for air at the bottom to pass over the inner heating surface of the radiator. The shape of the sections is such as to permit a large radiating surface on the outer portions of the radiator and to permit the inner portions to radiate directly through



The Touraine Radiator.

the openings between the sections. Another feature is that the columns are so arranged in reference to each other and so shaped as to effect a flue construction, so that the radiator is said to be highly efficient in circulating the air in the room by taking it off the floor and discharging it from the upper portion of the radiator thoroughly warmed into the room. Circulars giving full description, dimensions and prices can be secured on application.

Double Acting Pump Cylinders.

The Humphryes Mfg. Company, Mansfield, Ohio, have brought out two double acting pump cylinders, as here illustrated. Fig. 1 represents a double acting cylinder which can be used with all their pumps. On the up stroke the valve C raises, allowing cylinder to fill with water Spool valve G drops on valve seat on plunger bottom M and opens ports at upper end of plunger F, allowing water to pass through plunger and out through plunger tube H. On down stroke of plunger water passes through bottom of plunger M and around and through spool valve G, discharging through plunger tube H, filling top of cylinders,

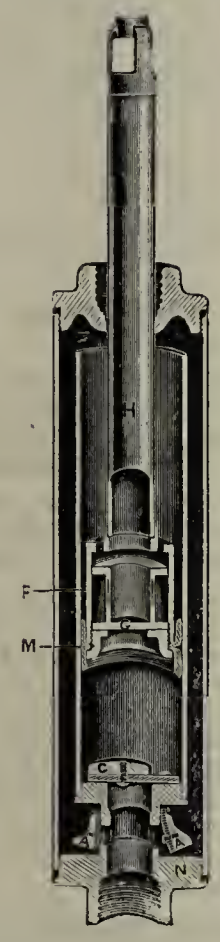


Fig. 1.—Double Acting Pump Cylinder.



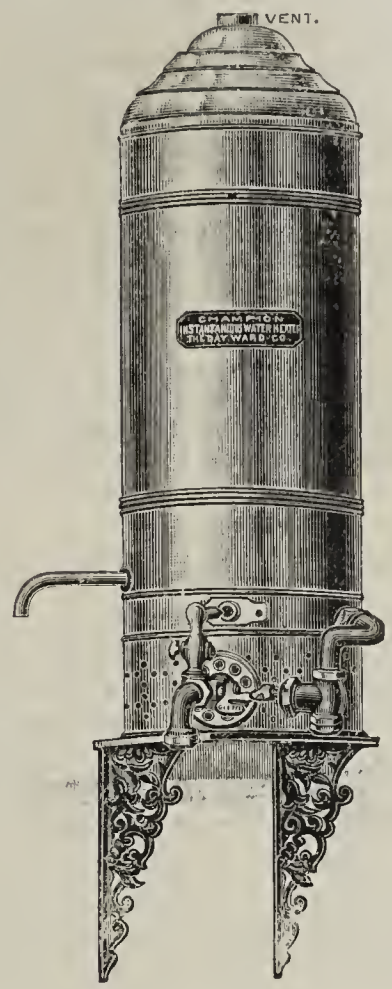
Fig. 2.—Double Acting Cylinder without Outside Shell.

giving full capacity. The flow of water being through plunger tube H, there are no valves required at upper end of cylinder. We are advised that one advantage of this construction, which will doubtless be appreciated by pump and well men, is the fact that it requires only the unscrewing of top cap to remove the plunger. There being no packing box or packing insures an easy working cylinder. The bottom cap N is made in one piece, forming bottom cap and valve seat. On downward stroke of plunger valves A A open, allowing water to fill upper end of cylinder. Valves A A are leather faced and weighted and are hinged so that when water rests on them they are perfectly seated. It is pointed out by the manufacturers that with but three simple valves at the bottom, durability is increased, and being easy of access they can be repaired at slight expense. The cylinder is said not to leak and never to require priming. Cylinders can be furnished with outside cylinders of iron or brass, but inside parts, we are told, should always be of brass. The cylinder Fig. 2 is similar in construction to the cylinder shown in Fig. 1, except that there is no outside shell, and it is used for submerged cylinder. The top cap has ports through top which allow the water to pass downward when the top of cylinder is filling. The valve below ports of cylinder at top is in one piece, faced and finished to seat perfectly. On down stroke of plunger F this valve drops and allows top of cylinder to fill. On up stroke the valve closes and water passes through plunger F and discharges through valve rod H. Plunger and top valve can be taken out by simply unscrewing top cap, as cap and valve are attached.

The Burgess Soldering Furnace Company, Columbus, Ohio, have during the past year added to their factory several new machines to enable them to make better goods more expeditiously. They expect to offer to the trade on March 1 a new Plumbers' Furnace on which a patent has been granted, a feature of which is two flames, one a blow pipe and the other a noiseless flame. These flames can be used separately or together, in the latter case giving a very intense heat.

The Champion Instantaneous Water Heater.

The convenience attending the use of instantaneous water heaters has changed them from a seasonable article to an article salable all the year around to a



The Champion Instantaneous Water Heater.—Fig. 1.—A General View.

plumber who introduces them to his trade and gives them the attention that a specialty that is profitable will warrant. One of the newest candidates for favor is the

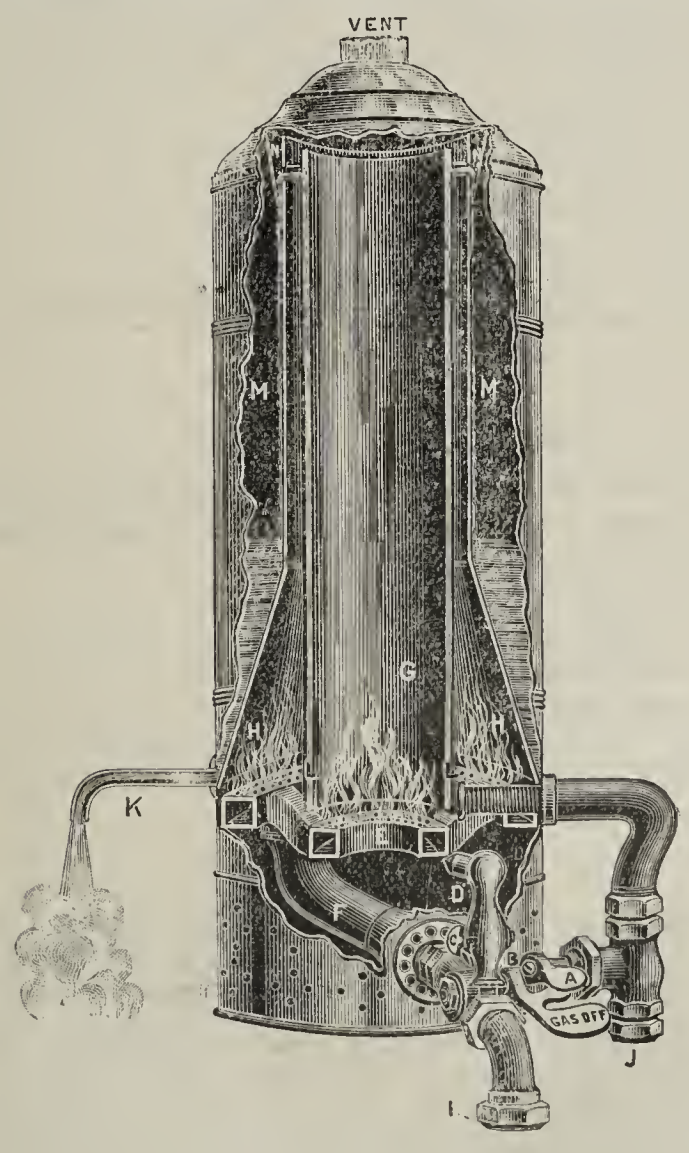


Fig. 2.—Interior View of Heater.

Champion instantaneous water heater made by the Day-Ward Company, Warren, Ohio. A general view is presented in Fig. 1 of the heater resting on a shelf as ar-

ranged for use in a bathroom or kitchen. The heater is made entirely of copper, tinned wherever water comes in contact with it, and fitted with brass trimmings. It is made in two sizes, the larger size having been just brought out, though the smaller size has been thoroughly tested and has demonstrated a capacity for heating 1 gallon of water a minute from 50 to 120 degrees, or will heat enough water for a bath in from 10 to 15 minutes with a consumption of 1 foot of gas per minute. An interior view showing the construction is given in Fig. 2. As will be seen from the cut, there are inner and outer burners, water chambers and combustion chambers. Water is supplied to the inner chamber direct, where it rises and overflows to the outer chamber through the tubes at the top. From the water chamber it is discharged hot, as shown. By the arrangement of the water and combustion chambers a large surface is presented for heating water and the full power of the gas is utilized. The cocks controlling the gas and water supply are so arranged that the gas cannot be left burning when the water is shut off, but as the water cock is closed the gas cock is also closed. The larger heater has a capacity for heating 1 gallon of water per minute from 50 to 140 degrees. The company also make a full line of copper lined, galvanized and enameled baths and have circulars giving prices and full particulars in reference to their goods.

Reception of Chicago Master Plumbers.

The courtesy is acknowledged of a complimentary ticket to the Chicago Master Plumber' Association's annual reception and ball. It will be held this year at Medinah Temple, Jackson boulevard and Fifth avenue, Tuesday evening, January 25. The Arrangement Committee consists of Paul Redieske, P. M. Murphy, C. C. Breyer, F. P. Schuster, C. J. Herbert, J. R. Alcock, E. Hackett, Robert Griffith, J. J. Doyle, D. J. Rock, T. P. Culloton, Samuel Smith, J. O. Sawkins and J. J. Clark. John G. Roland is chairman of the Reception Committee and Thomas Conlin is chief of the Floor Committee, with J. O. Sawkins assistant chief.

Pittsburgh Master Plumbers.

We learn from Secretary George Sands that at the annual meeting of the Master Plumbers' Association of Pittsburgh and vicinity, held in the Builders' Exchange, Pittsburgh, Pa., the following officers were elected to serve for the ensuing year:

President, John M. Addy.
Vice-President, Frank J. Gray.
Secretary, George Sands.
Treasurer, Frank McKnight.
Sergeant-at-Arms, W. J. Billings.
Executive Committee: D. G. Deeley, J. J. Kenedy, R. M. Tate and Joseph A. Weldon.

Peoria Master Plumbers.

The Master Plumbers' Association of Peoria, Ill., met in annual session on December 28, 1897, and elected these officers for the ensuing year:

President, W. W. Murphy.
Vice-President, Richard Erion
Secretary, John Boyd.
Treasurer, Daniel O'Connor.
Sergeant-at Arms, R. G. Trefzger.
Trustees: William Murphy, John M. Simpson and Rudolph Trefzger.

NOTES.

The American Boiler Company's Steam Boilers and Hot Water Heaters will hereafter be supplied to the Western trade by the Kellogg-Mackay-Cameron Company, 84 Lake street, Chicago. The company will also handle Steam Fitters' Supplies, Pipe, Radiators, &c., as has heretofore been done by the American Boiler Company at the same address. They will not do any contracting, but merely furnish the trade with supplies. The members of the company are Clarence V. Kellogg, James Mackay and Wm. A. Cameron, long connected with the American Boiler Company, and all men of wide experience in the heating line.

The Wallace Plumbing Improvement Company, Kokomo, Ind, manufacturers of Noiseless Water Closets, have issued a handsome 32 page catalogue of their products. They manufacture a variety of designs, all having low down tanks. These Closets are claimed to be not only noiseless, but so constructed as to flush the drain, have no rigid connections to break, contain no iron to rust, have no delicate mechanism to get out of repair, have no jet, and will not stop up. The designs shown comprise a wide variety of styles, from severely plain to highly ornamental.

I. Krueger, plumber and steam fitter, of Butte, Mont., passed through Chicago on Wednesday on his way to Europe. He was accompanied by his family, and is taking them abroad for a pleasure trip.

Patterson, Gottfried & Hunter, 156 Centre street, New York, send us a six-page folder of the McClelland Oil Purifier. It is designed for purifying the oil used in machine shops and factories, so as to allow the sediment to settle and to strain off the foreign substances. The oil enters the Purifier at top, and after passing through a warming chamber is discharged into a body of water for further purification, and has to pass through a wire gauze before it reaches the receptacle for the purified oil. For the use of steam fitters, or those who cut large pipe, these purifiers should be valuable for purifying the oil which has become foul with dust and chips from frequent use. The circular gives full particulars and can be secured on application.

Fred. Martin, Jr., has opened a plumbing shop in the Pythian Castle Building, at Wheeling, W. Va.

Charles E. Green has opened a plumbing, tinning and hardware store at Alfred, N. Y.

E. A. Seton has opened a plumbing and tinsmithing shop at Goffstown, N. H.

The W. Bingham Company, Cleveland, Ohio, send out a catalogue of Machinists' Tools, Carpenters' Tools, Blacksmiths' Tools and Manufacturers' Supplies. The catalogue is divided into four sections, A, B, C, D, covering the classification aboved noted. In the Manufacturers' Supplies is a subdivision of Plumbers' and Steam Fitters' Supplies, as well as other goods of interest to our readers

Notice is issued to the trade under date of December 30, 1897, that the partnership lately existing between Theodore Hepe, William Koven and Ludolph Oscar Koven, under the name of Hepe, Koven & Co., 18 Spruce street, New York City, has been dissolved, and the business will be continued by Ludolph Oscar Koven and Gustav H. Koven, under the name of L. O. Koven & Brother. The company announce that they will keep up the standard of the goods heretofore made by the old firm, and specially note that they will use only *iron* of the best quality in their Galvanized Range Boilers.

We have received from the Columbian Construction & Machine Company, Minneapolis, Minn., a photograph and circular of their new Columbia Hot Water Boiler. The Boiler is of the horizontal sectional type, and a surface burner, with the sections so arranged as to present a large amount of fire surface. The fire pot is corrugated to increase the heating surface, and the ease with which it can be set up is said to be one of the features. The Boiler is also adapted for steam heating. Full particulars and prices can be secured on application to the house.

The Nason Mfg. Company, 71 Beekman street, New York City, are just issuing a new price-list of their Valves, Fittings and Gauges for anhydrous and aqua ammonia; also Fittings, Valves and Cocks for brine circulation, adapted for ammonia machinery for ice making and refrigerating purposes. The special feature of the catalogue is a change in prices, which took effect January 1. The catalogue shows engravings of Valves, Elbows, Flange Unions, Return Bends and Couplings, besides Gauges and Glass of various shapes adapted to this work. One of the specialties shown is the new Nason Joint for making connections on ammonia service pipes.

Joseph Cleve, special partner, has retired from the Kohler Furnace & Steam Heating Company, Boston, Mass. The business will be continued by Joseph Kohler and Joseph E. Hertig under the old firm name.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until January 27, for a hot water heating and ventilating apparatus for the new extension of the United States Court House and Post Office Building at Little Rock, Ark.

Judge Jacob A. Kohler, in the Court of Common Pleas, at Akron, Ohio, on December 30 rendered a decision that the Ohio plumbing law was unconstitutional. The chief point made against the law was that it discriminated against the individual in favor of firms or corporations. In his decision he said: "A man may be a practical plumber, he may have had many years of experience and may be an expert, yet he is at once required to apply for a certificate, submit to an examination, and pay a license fee, before he can work at his trade. But for a firm of

partners composed of two, three or more persons, all that is necessary is that one member shall obtain the certificate and then all the other partners can work at the business, whether they are qualified or not, and they may employ, in addition, as many workmen as they please, whether they are qualified by experience or not."

Mills, Horton & Reed are a new firm at 136 Eddy street, Providence, R. I., who make a specialty of Mill Supplies, Valves, Pipe and Fittings. In addition to the fine assortment of stock which they carry they have a well equipped pipe cutting shop.

Thomas J. Cusack has moved his plumbing shop to the Van Nostrand Building, 259 Fair street, Kingston, N. Y.

At the annual meeting of the Plumbing Board of Kingston, N. Y., Bernard Loughran was elected president, P. A. Canfield treasurer, and Augustus Schepmoes secretary.

At midnight on New Year's eve the licenses of 135 plumbers at Buffalo, N. Y., expired, and made it necessary for them to take out new licenses from License Clerk Wilcox, at the Mayor's office, at the rate of $10 each. In addition to their licenses the plumbers must furnish new bonds for $2000, and each must have at least two sureties.

Prowse & Pelton are a new firm in the plumbing business at Herkimer, N. Y., succeeding Prowse & Thompson, Frank E. Pelton having purchased the interest of E. S. W. Thompson.

F. G. Wilson has made some handsome improvements in his plumbing shop on Ash street, Waterville, Maine.

It is reported that at least 40 per cent. of the plumbers examined at Milwaukee, Wis., failed to pass the examination. At a special meeting of the Master Plumbers' Association of Milwaukee, Wis., a resolution was adopted indorsing the action of the State Plumbers' Examining Commission and expressing approval of the new State law as well as expressing confidence in the Plumbers' Examining Board.

John McKarnes, formerly a resident of New Castle, Pa., has established a plumbing business at Ripple, Col.

O'Day & Moore are a new plumbing firm at Owensboro, Ky., located on East Main street.

George H. Hersey of Buckfield, Maine, has completed the installation of a steam heating system in McKenzie's new brick block, which will contain three offices, seven tenements and a large store. The Boilers used are of Mr. Hersey's invention, and manufactured by him at his plant in Buckfield.

The New Jersey sanitary potters received, after all, the restoration of the 12½ per cent. cut made in their wages in 1894, as promised by the employers last summer, and the expected strike was averted. A conference between the employers and the men was held last week at Trenton, N. J., at which it was decided to make the restoration, to remain in effect until February 1. In the meantime it is hoped that the Eastern and Western manufacturers will come to some agreement upon a uniform scale of wages in the industry.

T. C. Lamson, Elizabethtown, Essex County, N. Y., has sold his hardware store to D. F. Stetson & Co., who will enlarge the store and keep all kinds of Light and Heavy Hardware. They have secured the services of T. Frank Clark, who will manage the plumbing department. Stetson & Co. will be glad to receive price-lists of goods in their line from manufacturers and jobbers.

Frank Schimpf, Albany, N. Y., recently presented Plumbing Inspector George Bachman with an appropriate souvenir of his trade. It was a miniature cast iron bathtub of enameled finish.

J. L. McBride, Missoula, Mon., has moved his plumbing shop to the Yerrick Block. He has been busy making a lot of Tinners' and Hardware Sundries, and is selling the Garland Economic and Surprise Stoves.

The Master Plumbers' Association of Cincinnati, Ohio, decided that with the first of the year they would inaugurate a war upon the unlicensed plumbers plying the vocation in the city. The discussion was productive of a great deal of excitement at the last meeting of the association, and after a long session it was decided to swear out warrants for all plumbers in the city who have no license. This, it is said, may involve certain members of the Fire Department who were plumbers before they became firemen. It is the custom of these men to repair the breaks in the plumbing about the various fire houses, but, while the majority of them are competent plumbers, none of them have taken out licenses.

Henry Goss, Dent Yates, Ed. Springsteen, Fred. Hacker and W. E. Searight, representing the master and the journeymen plumbers of Kansas City, Mo., held a conference on December 30, 1897, with Mayor Jones and Water Works Superintendent Longwell about matters of interest to the associations they represented. They asked the Water Works Department to cease granting permits to do plumbing work to parties who are non-members of the unions and who have not paid the regular tax of $10, and also that the department grant no more permits to engineers of buildings to do plumbing repair work. They also urged the city to stop selling water meters to consumers and that the plumbers be allowed to bid at such sales and that the consumer shall buy of the lowest bidder. They further asked that the Water Department inspectors be required to pass regular plumbers' examinations. City Plumbing Inspector Sieben was at the conference, and after the entire subject was gone over it was agreed that the complaints should go to the Council and the Board of Public Works for investigation.

The Alfred Edmondson Company have been organized at New Haven to conduct a plumbing business with a capital of $1000 in ten shares of $100 each, all paid in. The subscribers are Alfred Edmondson, one share; Florence A. Edmondson, eight shares, and William H. Edmondson, one share.

The Eastern manufacturers of Lead Pipe and Sheet Lead reduced the price of those materials on January 1. Particulars of the changes made will be found in our trade columns.

Stanley G. Flagg & Co., Philadelphia, announce that they have opened a New York office in the St. Paul Building, 220 Broadway, under the management of C. A. Jaynes.

We received in our mail what seemed to be an old-fashioned calfskin wallet with a strap passing around it to prevent its contents being lost. On opening it we found a draft payable to bearer for 365¼ happy days on the Bank of Health, Wealth and Happiness, drawn by the Judson A. Goodrich Company, 120 Beekman street, New York City. At the end of the draft is a suggestion that the receiver send a trial order for the Water Seal Automatic Air Valves, which, it is claimed, will make all interested glad. On opening the wallet full we see the trade-mark of the Judson A. Goodrich Company, which calls attention to their line of Valves and other high grade steam specialties, with the suggestion that they will be good goods to use during the coming 12 months.

The will of Alfred Nobel, the Swedish chemist and inventor of high explosives, who died a year ago, has been proved. About half the estate is to be invested and the interest divided annually into five prizes of about $10,000 each. Prizes 1, 2 and 3 are to be awarded to the persons making the most important discoveries in physics, chemistry, physiology or medicine, Prize 4 is to be given to the person making the best literary contribution on the subject of physiology or medicine, and Prize 5 is to be awarded to the person who has achieved the most or done the best things looking to the promotion of the cause of peace throughout the world. These prizes, which are all open to any persons anywhere in the world, will be awarded by the various Swedish academies.

A new type of the Gordon rapid fire gun of 5-inch caliber has just been completed at the Watervliet Arsenal and will be shipped to Sandy Hook for trial. It is claimed that the improved breech mechanism of the new gun makes it the most effective type of secondary ordnance ever produced in this country.

A dispatch from Port Townsend, Wash., states that during the coming season the Standard Oil Company will begin extensive operations on the Pacific Coast. Their oil territory in Alaska will be developed and the output brought to the cities of the Pacific slope for distribution west of the Rocky Mountains. It is also contemplated to ship oil from the Coast to South America and Australia.

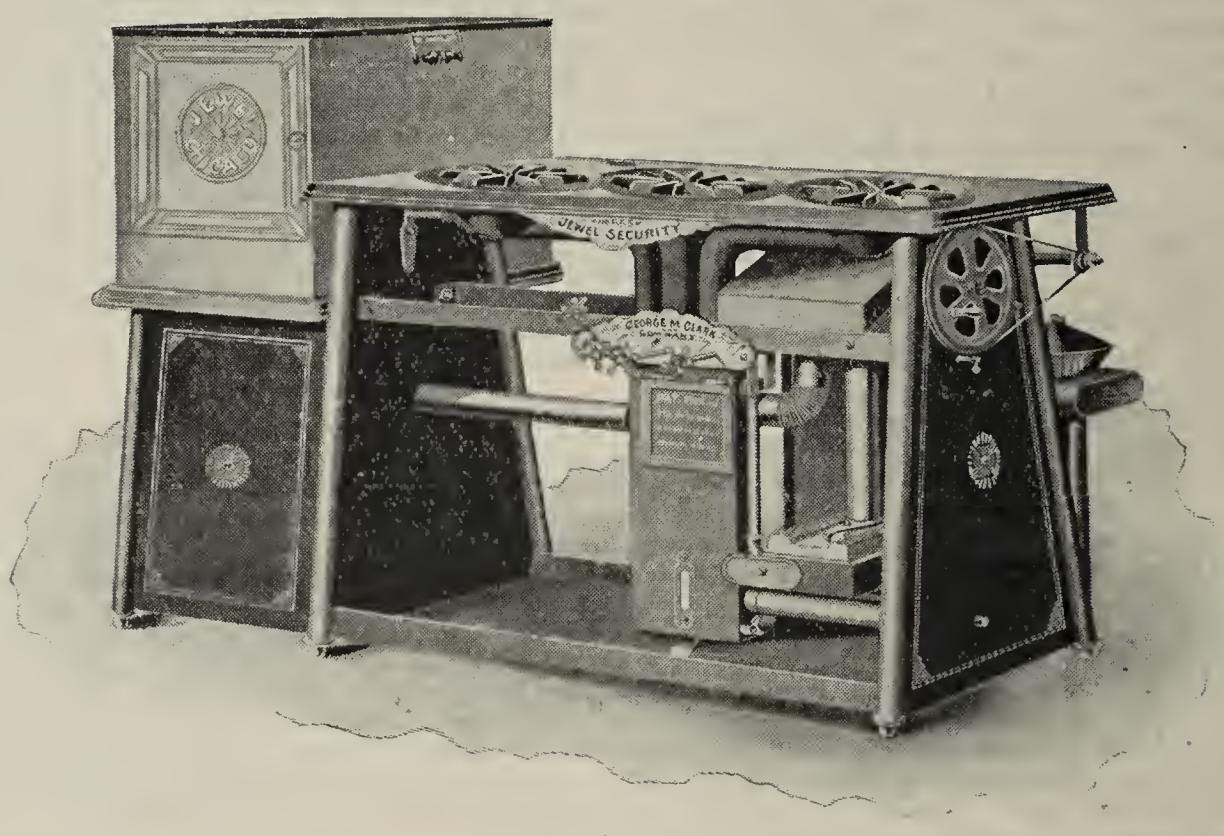
During the year 1897 the value of exports from Newport News, Va., exceeded that of 1896 by more than $8,000,000, showing that that port is rapidly coming forward as one of the leading seaport cities of the South. The actual figures of exports in 1897 were $26,304,126, as against $18,150,049 in 1896 and $13,584,377 in 1895, so that in two years the exports of Newport News have almost doubled.

The control of the Trinidad Asphalt Company, whose headquarters have heretofore been in New York City, has been secured by a syndicate of English capitalists, and from January 1 the headquarters of the concern will be located in London. The company have been reorganized and their capital increased from $3,500,000 to $5,000,000. Their supply of asphalt comes from the West Indian island of Trinidad.

THE RETAIL STORE.

THE ENAMELED WARE CONSOLIDATION.

The negotiations between manufacturers of enameled and stamped ware have been in active progress during the week, and it is understood that the prospects of an early completion of the proposed combination are daily becoming more clear. Ex-Congressman Niedringhaus of the St. Louis Stamping Company, who has again come East, has been in communication with representatives of the various concerns interested in the project, and meetings have been held this week in New York City with the result that the final consummation of the plan, so far as regards a majority of the enameled ware makers, is regarded as almost certain. There are numberless details, however, to be adjusted, which it may take some weeks to get into shape, so that the final organization of the new concern is not likely to take place immediately. That the new combination will not include one or two of the largest interests in the industry is generally accepted as a fact. The oldest and most important enameled ware manufacturing concern in the East have definitely refused to enter it.



The Jewel Security Gasoline Stove.

The Jewel Security Gasoline Stove.

An illustration is herewith presented of a radical departure from the beaten track in gasoline stoves. George M. Clark & Co., 72 to 76 Lake street, Chicago, have brought out an entirely new line of gasoline stoves, named the Jewel Security, of which they are the sole manufacturers. The style shown in the illustration is their largest size, with three burners on the top and a burner on the step. A smaller size is made, with two burners on the top and a burner on the step. It will be observed that the gasoline tank instead of being elevated is placed below the level of the top of the stove, in the rear. The Jewel Security stoves do not burn gasoline in the burners, but gas generated from the gasoline. They are therefore, in fact, gas stoves. The following description is furnished by the manufacturers:

"The gasoline tank is 3 inches below the valve outlets. Not a drop of gasoline can escape from the stove even if any or all the burner flames should be blown out and the valves left open. For this we depend upon the simple fact that a liquid will not rise above its level. The unobstructed operation of the unfailing law of gravitation makes these stoves absolutely safe. We do not rely upon a float or any other mechanical device, which may fail at any moment. The tank cannot be filled except by raising the tank cover, which automatically and instantaneously puts out all flames. The tank is also in a fixed position and at a convenient hight to fill.

"The gas for the starting burner is generated by a rotary device in a brass cylinder connected with the gasoline tank. Turn the wheel at the right hand end of the stove for 30 seconds, first applying a lighted match at the door in the generator casing; then open the valves and light as many burners as are needed. No dripping of gasoline, no smoke, no smell; nothing but a pure gas flame for lighting; no puffing or blowing, and the full capacity of the stove is available at once. The freedom from odor is absolute, both in lighting and while burning and when the burners are turned out; there is no unconsumed gas in the stove.

"When the kitchen is so cold that the starting burner does not light, turn the wheel with a reverse motion for a few seconds, first applying a lighted match to the warming burner. After thus heating the air pipes and connections, proceed in the regular way. It is seldom necessary to use this burner, but its addition makes the Jewel Security an all-the-year-around and all-the-world-around stove, working as perfectly in December as July, and in the Klondike as on the Equator.

"The gas is generated from gasoline and burned in the same state in which it is used in our Jewel Smokeless Generator stoves; that is, the gas is heated and expanded before burning instead of being burned unexpanded and nearly cold, as in the Princess stoves. This means that more heat units result from every gallon of gasoline, and the economy which we claim for the Jewel Smokeless Generator stoves over all other low tank stoves and over Process stoves holds good for Jewel Security stoves also.

"The burner caps are 5 inches in diameter and make a large hot flame. There are two burners on the step 8½ inches from center to center, so that a cooking vessel can be used over each burner. A small flame at the generator is burning constantly while the stove is in use. This heat is further utilized by conducting it to the stove top, where it warms the stove top and keeps food or water at the simmering point. This fills a want long felt on gasoline stoves. A warm stove top is a great convenience, as cooked articles can be kept warm indefinitely.

"The valves which control the flames are not needle valves, but valves with a blunt end which have slight wear and are practically indestructible. The gasoline is always at least 3 inches below the valve outlets. For this reason the outlets are not clogged with sediment washed into them by the gasoline, and are not rusted or gummed up by impurities in it.

"The gas is delivered into the burner tubes from an injector plate which has several openings so arranged that

the burners are as hot as those of a high tank stove, althongh the tank is 3 inches below the valve outlets and the pressure is low.

"The tank, with its accompanying parts, is of heavy sheet brass, polished and lacquered. The generator tubes are of brazed brass tubing. The generator, injector head and injector plates are of cast brass. The burner caps, burner tubes, and generating, starting and warming burners are of cast iron. The generator casing is of heavy sheet steel. The brace bars are of heavy steel. Tops and legs are handsomely japanned and ornamented. The name and number plates are highly polished and nickel plated.

"The tops are of smooth cast iron with flush grates, and yet there is no trapping of gas. The legs are of heavy sheet steel, formed into a roll at the edges so as to give great strength and also appear massive.

"The stoves as shipped are tested and ready for use when removed from the crates. No time is wasted by the dealer in unpacking parts and setting up the stove."

The Dean Can Opener.

Henry E. Dean & Co., 180 Austin street, Worcester, Mass., manufacture the Dean can opener, a general view of which is shown in the accompanying illustration. The construction of the utensil is clearly revealed in the engraving, it consisting of an upper forked casting with a blade beneath. The opener cuts on either side. All parts are nickel plated so as to keep it from rusting.



The Dean Can Opener.

MEMORANDA.

The Lalance & Grosjean Mfg. Company, New York, made by far the largest output of Enameled Ware in their history during the year just closed Their factory at Woodhaven, L. I., ran almost continuously throughout the year and absorbed all the products of the company's rolling mill and Tin Plate plant at Harrisburg, Pa. Both establishments are running to their full capacity, and the concern start the new year with a large volume of orders on their books. The gradual substitution of Enameled Ware for Tinware throughout the country is very clearly reflected in the business of the concern, the orders for Tinware showing a steady decrease, so that at the present time this branch of their business, which was at one time a very large one, is relatively quite unimportant. The L. & G. Enameled Ware is finding its way to all quarters of the globe. The firm filled an unusually large number of export orders for these goods in 1897 and look for a still greater increase in this department during the present year. The company are getting out a new catalogue of Enameled Ware, which will be ready for distribution to the trade in a week or two.

The Wagner Mfg. Company, Sidney, Ohio, report a very satisfactory year for 1897 and have recently made changes to enable them to meet the increasing demands for their Cast Iron and Aluminum Hollow Ware.

The catalogue of Tinware issued by Kerwan & Tyler, 714 Water street, Baltimore, Md., is a neatly printed volume of over 100 pages. The goods are divided into sections classed as Stamped Ware, Deep and Shallow; Spoons, Japan Ware, Pieced Ware, Heavy Polished Ware, Copper and Brass Goods, Sheet and Wrought Iron Ware, Galvanized Ware, Hollow Ware, Wire and miscellaneous goods, Tinners' Trimmings, Enameled Ware and assortments, the whole being indexed alphabetically at the end.

The Grand Rapids Refrigerator Company, Grand Rapids, Mich., have issued in green covers an edition of their catalogue relating to the Leonard Cleanable Refrigerators. It is a volume of 90 pages and is profusely illustrated with cuts showing the outside and inside of a very great number of different styles of the Leonard Refrigerator, varying from the simplest Ice Box to the most elaborate sideboard Refrigerator. In the early pages detail views are given of all the special features of this Refrigerator and the merits of its construction are carefully explained. The bulk of the catalogue merely presents illustrations with tables of sizes and prices of the different styles. In calling attention to the changes of style for 1898, it is pointed out that the former heavy sunk carving is changed to a dainty design in raised carving, and the bottom and back of the case are now paneled as well as the front. These catalogues will be sent free upon application.

The Indiana Wire Fence Company, Crawfordsville, Ind., send to their friends a calendar for 1898 decorated with a very charming engraving after a painting by Kray. The calendar calls attention to the products of this concern, which include Wire, Wire Nails, Staples, Fencing, Wire Stretchers, &c.

A charter was recently issued to the Griswold Mfg. Company of Erie, Pa., whose capital is placed at $100,000.

The Toledo Tinware Mfg. Company, Toledo, Ohio, makers of Pieced, Stamped and Galvanized Ware, keep themselves and their goods before their customers by means of a poster calendar, which they distribute with their compliments. The sheet is brass bound and the illustration is an attractive young baker handling sheet metal goods of the Toledo Tinware Mfg. Company's production.

Pfender Brothers, Evansville, Ind., issue a handsome calendar for the new year. The card, cut in silhouette, presents two pretty children, and they direct attention to an announcement respecting the value of Pfender's Patent Metal Pump. The coloring is very beautifully done and the whole will make an attractive wall ornament.

The fitting up of the new factory of the Hill-Whitney Aluminum Company, at Waltham, Mass., was completed this week and the company are now in shape for operation. They are occupying a portion of the Waltham Emery Wheel Company's building, to which their employees and manufacturing plant were removed last month from their former location at Fairhaven, Vt.

The Indiana Mfg. Company, Peru, Ind., are distributing their catalogue of North Star Refrigerators for the season of 1898. The catalogue comprises 48 pages, displaying a large line of Domestic Refrigerators. They are made of hardwood and lined with cork. The cabinets are furnished with carved or plain panels. A cheaper line is made under the name of Indiana Refrigerators. The company not only furnish large Refrigerators for heavy service, but are also prepared to build cooling rooms to order.

Wright & McKenney, Centerville, Md., are building an addition to their store, which will make the total length of the establishment 328 feet, with a frontage of 25 feet. The house are wholesale and retail dealers in Shelf and Heavy Hardware, Agricultural Implements, Stoves, Tinware, Sporting Goods, &c.

H. A. Decker, dealer in Stoves, Tinware and Hardware, has removed his stock from Crested Butte, Col., to Ward, where he is now comfortably settled. Mr. Decker refers to business as fair, but is looking for a much better demand in the spring.

Dickes & McCready, Butler, Ohio, are enlarging their warehouse and are also adding a tin shop to their business.

Wm. Sigler & Co. of Chicago have purchased the Hardware and Implement business of J. W. Evans & Co., Webster City, Iowa. They state that their store is one of the best furnished in the State. It is 130 feet deep, with an L 28 x 26 feet. The wareroom is 116 x 90 feet, with railroad switch at side. The firm carry a full line of Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c.

H. McGee Sanders has opened a new Hardware store at 577 King street, Charleston, S. C. Mr. Sanders is carrying Shelf and Heavy Hardware, Stoves, Tinware, Implements, Sporting Goods, Saddlery, &c.

The Columbia Gas Illuminating Company, 818 Arch street, Philadelphia. are calling the attention of the hardware and jobbing trade to their line of incandescent gas lamps and mantels. They point out the fact that there is a large field for the hardwareman who will handle this line of goods, as previous productions in the line have been notably high priced. The company state that their lamps can be used wherever gas and gasoline are procurable, and their use insures a brilliant light with a great saving in gas consumption.

The Board of Ordnance and Fortification of the Army has made an allotment of $31,000 to be expended by the Army Ordnance Bureau for tests of high explosives. It is contemplated to devote this money to the purchase of armor plates. Tests will be made with these plates under conditions closely resembling an engagement between forts and heavy ships, in order to determine what penetration and explosive effect would create the greatest amount of damage to an invading fleet. The experiments are to be conducted at the Sandy Hook proving grounds next summer.

The Indestructible Post.

The cuts shown herewith represent the Indestructible post, manufactured by the Indestructible Post Company,

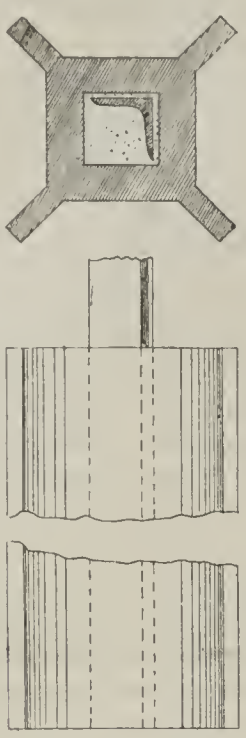


Fig. 1.—The Indestructible Post.

Brazil, Ind. In Fig. 1 the base of the post is shown, the darker portion of the cut being a sectional view of the base. The post consists of a base made of burnt clay and a post of steel, to which the fence wires are fastened by metal staples. The space between the base and the post is filled with cement, so that the steel post will not come in contact with earth or water, and consequently, it is pointed out, will not rust. The exposed part of the post is painted with a preparation which, it is stated, makes it extremely durable. For common line posts a base 2½ feet high is used. A 1½-inch square hole in the center of the base extends through its whole length, and the clay surrounding it is ¾ inch thick. The corner projections are ½ inch thick and extend along the entire length of the base. The manufacturers state that this shape of base affords a greater resistance to the earth than round or square posts of equal diameter; also that the post is not affected by heat or cold, withstanding all the ravages of time. The indestructible posts are not only adapted to plain or barbed wire fences, it is explained, but to any style of patent fencing, such as woven wire, cable, mesh, poultry netting, &c. Hitching, lawn, signal, mile and other posts are also manufactured by the company.

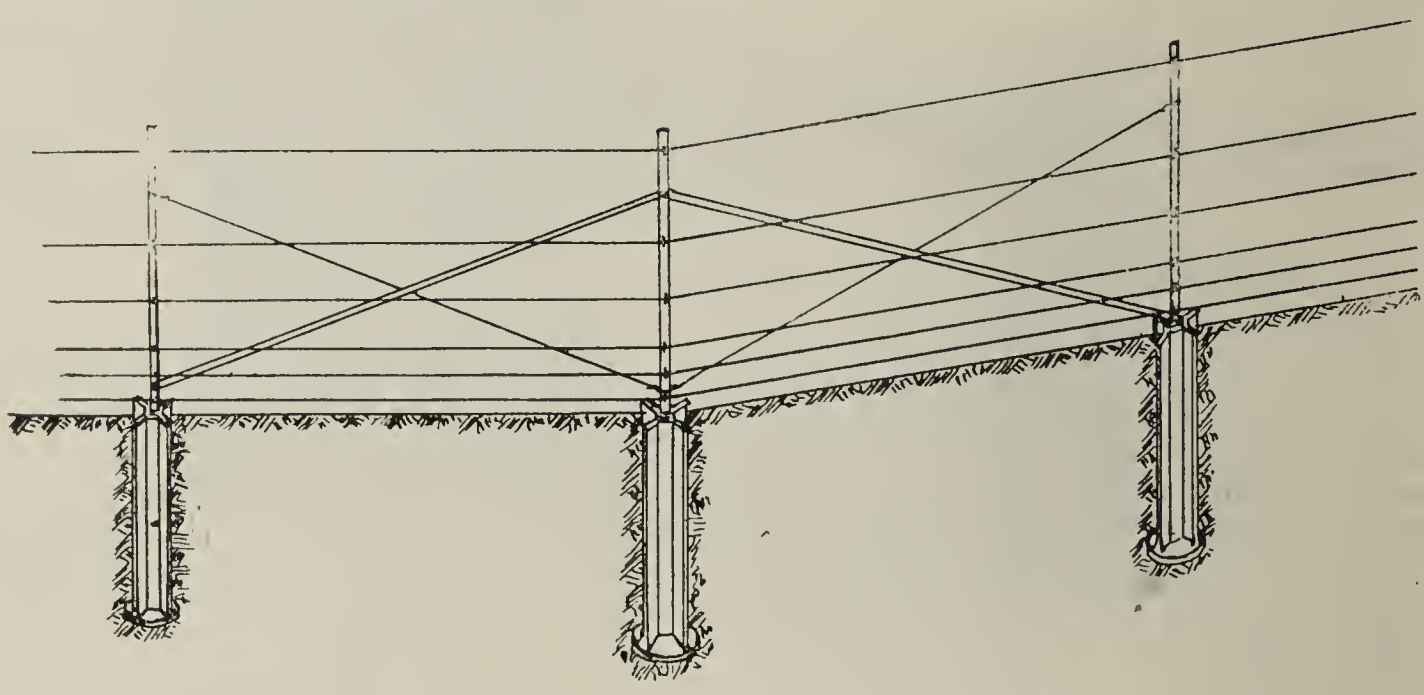


Fig 2.—Indestructible Post Fence.

A Unique Letter Head.

Considerable ingenuity has been displayed in the arrangement of articles making up the letter head of the Clark Supply House, Noblesville, Ind., of which a reproduction is herewith given. The lines of goods carried include Tile, Mantels, Stoves, Chandeliers, Horseshoes, Blacksmiths' Supplies ; Gas, Steam and Well Supplies and Tools ; Fire Clay, Fire Brick and Sewer Pipe; Wood and Iron Pumps. In selecting the articles of which the letters are made a fair representation of these lines has resulted. Moreover, it produces a letter head which once seen is readily recognized and immediately associated with the concern using it.

The Maine Mfg. Company, Nashua, N. H., have sent a special agent to the South and West in the interests of White Mountain Refrigerators of their manufacture and report that he is remarkably successful in placing orders for these goods. In addition to the White Mountain Refrigerators they have also sold a large number of their new Cleanable Duplex Circulation Klondike line, of which they are sole manufacturers. The firm are about to publish a handsome Refrigerator catalogue, which they will be glad to send to reliable dealers upon application.



Letter Head (Slightly Reduced in Size).

TIN PLATES.

William H. Trotter.

William Henry Trotter, for many years head of the well-known firm of Nathan Trotter & Co., importers and dealers in tin plate and metals, Philadelphia, Pa., died of pneumonia at his residence, 1303 Spruce street, Philadelphia, on January 5, after a few days' illness. Mr. Trotter was born in Philadelphia on November 1, 1822, and entered, when young, the firm established by his father, Nathan Trotter, in 1790. He retired a few years ago, and the business of the firm has since been conducted by his three sons. He was well known in the business and financial circles of Philadelphia, and at the time of his death was connected as a director with a number of local financial and insurance corporations. He was also a member of the Art Club and of the Pennsylvania Historial Society. Besides his three sons, Mr. Trotter is survived by his wife and three daughters.

American Base Box.

The American Tin Plate Company, Marquette Building, Chicago, state that they have not prepared the American base box system of tin plate quotations merely for their own special use, but for the trade in general. They copyrighted the Ratio and Code Book simply because that seemed to be the proper course, and not to keep others from using it. They request us to impress upon the trade that any one desiring to use the matter of the Ratio and Code Book will be given permission upon application. To facilitate the wider circulation of the information, compiled by them at great expense, they will furnish a full set of electrotypes of the pages of their book for $100, covering all the rules, ratio and code. The electrotype of the title-page has a space cut out for the insertion of the name of the manufacturers or jobbers who desire to use the matter for this purpose. As it would cost much more than $100 to set the type anew for the work, this will effect a very considerable saving. The offer is so liberal that the company are warranted in expecting it to be embraced by numerous members of the trade.

SCRAP.

At the meeting of Tin Plate makers held last week at Columbus, Ohio, a committee was appointed to prepare plans looking to a definite organization of the Tin Plate Makers' Association of the United States. The committee has been in session this week at Pittsburgh, but up to the time of going to press no news of the result of their deliberations had been received. It is understood that an earnest effort will be made to get the manufacturers together with the view of arranging a basis of prices by mutual argeement. While prices may not be advanced to any extent, it is felt that the unnecessary cutting that is now being done in some quarters should be checked in some way and the market steadied. The Columbus meeting was attended by a large number of makers, but it is understood that some of the most important interests were unrepresented. An effort will be made to get these concerns into line.

The Humbert Tin Plate Company, at Connellsville, Pa., are considering the advisability of enlarging from a four-mill plant to a six-mill plant. If certain arrangements can be made with parties who bought lots when the initial plant was established at Connellsville the additional two mills will be erected.

The business of Lambert, Stoughton & Cooper, dealers in Palm Oil, &c., Philadelphia, will be continued in future by Edward C. Stoughton and Francis L. Cooper, under the firm name of Stoughton & Cooper.

Marshall Brothers & Co., Philadelphia, have ordered a No. 2 Mesta Pickling Machine from the Leechburg Foundry & Machine Company, Pittsburgh, Pa.

A greeting for the new year comes from Follansbee Brothers Company, Pittsburgh, Pa., on a calendar blotter. The decoration shows Fortune, or some other benignant deity, pouring out prosperity upon the United States.

The latest official report of the Swansea Royal Metal Exchange, Swansea, Wales, has the following : From reports as to the American Tin Plate trade received, we are not booking any orders from that country other than the oil Plates, and we are told that in a very short time native production will have been increased so much that they will have a considerable surplus over their own consumption, which will, it is feared, be disposed of in other markets where they can compete with Welsh makers upon equal footing, so that we are not only likely to lose their trade entirely, but will also find them keen competitors elsewhere. Such is the present serious outlook, and it is predicted that very soon the wage rate in America will be brought down lower than that paid in this country, and that with the cheaper raw material will enable the Americans to compete with us in the matter of production irrespective of any impost of protective duties.

Official returns give the salmon pack of British Columbia for 1897 as 1,007,838 cases. This is larger than the pack of any previous year. Sixty-four canneries were operated in British Columbia last year.

The Morton Tin Plate Company, Cambridge, Ohio, who make a specialty of the manufacture of high grade Charcoal and Terne Plates, advise us that their business during 1897 was very satisfactory, they having all the business they could undertake. The company's works were in operation continuously throughout the year, and the demand for their special high grade Plates, made by the old style palm oil process, was considerably in excess of that of 1896.

E. L. Parker & Co., dealers in Tin Plates and Metals, 201 and 203 South Charles Street, Baltimore, Md., have favored us with one of the dainty calendars for 1898 which they are sending out to their friends and customers as a New Year's greeting. It is in the form of a series of cards printed in gold and embellished with clusters of forget-me nots in natural colors. Accompanying the calendar is a card giving the firm's various special brands of Tin and Terne Plates.

The plant of the Neshannock Tin Plate Company of New Castle, Pa., will be started up this month or early in February. This plant is the enlarged and remodeled mills of the old Arethusa Iron Works. formerly operated by Geo. W. Johnson.

The capital stock of the Shenango Valley Steel Company of New Castle, Pa., has been increased to $2,500,000. The additional capital stock will be used in the erection of the new Tin Plate plant of the Shenango Tin Plate Company, which will be operated and owned by the Shenango Valley Steel Company.

Edward H. Trotter has retired from the firm of Nathan Trotter & Co., Philadelphia. The business in Tin Plate and Metals will be continued by the remaining partners under the same firm name.

Hollinshead W. Taylor has been admitted as a member of the Tin Plate and Metal firm of N. & G. Taylor Company, Philadelphia, from January 1.

The rope wheels to be used in the power transmission plant of the new works of the Shenango Tin Plate Company, at New Castle, Pa., will be 22 feet 6 inches in diameter and 14 feet face, and will weigh 130 tons. They will be cast in sections and finished for 2-inch driving rope. There will be 11 of these wheels, and they will be built by the Edward P. Allis Company of Milwaukee, Wis.

W. J. Rainey, the Connellsville coke operator, with offices in Cleveland, Ohio, recently bought about 40 acres of very valuable coal lands in the heart of the Connellsville region. It is said the price paid was more than $1500 per acre, probably the highest price ever paid for coal lands in the coke region.

STOVE TRADE NOTES.

TRAVELING SALESMEN FOR 1898.

The Gem City Stove Company of Dayton, Ohio, have made arrangements with the following salesmen, who will represent them in the territory indicated: John P. Bauer will cover Michigan and Ohio; J. B. Kenney, Indiana; while C. H. Greene, Jr., with assistants, will cover Missouri, Iowa and Illinois.

The Charter Oak Stove & Range Company of St. Louis, Mo., will be represented on the road the coming year by S. H. Shannon, George P. Phillips, Charles Orrick, Frederick P. Haus, Robert E. Ryan, H. D. Knight, Charles N. Kelly, E. J. Moore, D. Hott, J. W. Jacob and Carl Phillips.

The Lebanon Stove Works of Lebanon, Pa., will have their interests looked after by J. H. Kurtz, who will cover Western Pennsylvania, Lancaster County and parts of Virginia and Maryland; and Stephen Light, who will cover Eastern Pennsylvania, New Jersey, Delaware and Eastern Maryland.

The Danville Stove & Mfg. Company of Danville, Pa., have arranged with the following salesmen to travel in the interests of their goods in the territory indicated: A. L. Canfield will be sales agent in New York and New England; J. C. H. Lynn, sales agent in Delaware, Maryland, Virginia, New Jersey and Eastern Pennsylvania; R. E. Edmunds will cover Western Pennsylvania and Ohio: while J. A. Pinkerton, A. H. Magoon and Peter Olsen will represent the company in Chicago, Ill.

The Fischer-Leaf Company, Louisville, Ky., will be represented this year by the following traveling salesmen: In Texas, by R. E. Finch; in Indiana, Louisville, Georgia, Alabama and Mississippi, by J. W. Hickman; in Ohio, Kentucky and Tennessee, by William Schlarger; and in Louisville, Ky., by Philip Ronnuell.

The Eclipse Stove Company, Mansfield, Ohio, report that 1897 was one of the best years in their history, and they intend to make 1898 "eclipse" all others by increasing their line of stoves and ranges by a number of new patterns and many improvements, and by the addition of several traveling salesmen. H. D. Bell, who has been representing the firm for the past five years in Illinois and Iowa, has been placed in charge of the sales department at the main office at Mansfield, Ohio. The following is a list of their repositories and traveling representatives: At Kansas City, Mo., Rood & McIntyre, manager, who will look after the business in Western Missouri, Kansas and Indian Territory; at Omaha, Neb., by Oscar Millsap, manager, who will look after Nebraska, Western Iowa, Colorado, the Black Hills, South Dakota and Eastern Wyoming; at St. Anthony Park, Minn., by H. E. Cook, manager, who will look after Minnesota, North and South Dakota; at Terre Haute, Ind., by the Townley Stove Company, agents for Southwestern Indiana and Southeastern Illinois; at Ottumwa, Iowa, George Haw & Co., agents for Southern Iowa and Northern Missouri. Their traveling salesmen are C. E. Munsell, in Western New York, Western Pennsylvania and Eastern Ohio; W. A. Cunningham, Western Ohio and Eastern Michigan; O. E. Jennings, Central and Western Michigan; B. H. Cook, Northern Michigan; F. M. Northway, Indiana; J. C. Bump, Wisconsin; and A. Knobloch, in Illinois and Northern Iowa.

The Cook & Van Evera Company, Chicago, will be represented in Iowa by J. C. Shirra and J. B. Batchelder; in Illinois by J. M. Collins and A. P. Sweatman; in Wisconsin by C. M. Harmount, and in Minnesota, by A. Vogel. Others are to be appointed for Indiana and Michigan.

The Kling Stove Company, Gallipolis, Ohio, will be represented by James Gibson in the territory of Ohio and Kentucky and by William Kling in Indiana, and West Virginia.

The North Second Street Stove Salesmen's Association.

On December 30 a representative body of the stove salesmen from North Second street, Philadelphia, Pa., gathered at the Bourse Building for the purpose of organizing an association and at the same time to enjoy a banquet. The object of the association is to foster friendly relations between the salesmen in the trade. At the meeting the association known as the North Second Street Stove Salesmen's Association was organized, and the following officers were elected:

President, Harry E. Borzell.
Vice-President, William F. Habicht.
Secretary, W. G. Withers.
Treasurer, Horace Tyson.

After organizing the association and electing officers the banquet was served, and among those present were Walter Hallowell, J. Elwood Yeager, George W. Wagoner, Robert Warner, Joseph Evans, John Kryder, W. H. Borden, John Bell, George Uniacke, John R. McKnight, E. E. Reinking, Alexander Colquhon, John H. Hobday and F. Sabin.

Vice-President Habicht acted as toastmaster, and nearly all those present were invited to respond to some toast which contributed to the pleasure of the occasion. At its close all voted the affair a highly successful one, and arrangements were made for similar meetings annually. Representatives of J. E. Yeager, F. M. Borden & Brother, Mount Penn Stove Works, Colonial Stove Works, Mahood & Co. and F. Sabin participated in the affair.

Ringen Stove Company.

Catalogue 32 issued by the Ringen Stove Company, St. Louis, Mo., covers their line of gasoline stoves and blue flame oil cook stoves. It is a handsomely published pamphlet of 50 pages, bound in enameled paper, with the name of the firm and their trade-mark displayed on the title-page. Backing the title-page is a reproduction of the far famed picture of Vesta crowning the Quick Meal stoves and ranges with the laurel wreath and palm branch. In the announcement to the trade the company mention that for 1898 the Quick Meal stoves will be replete with all the features that have made them famous in the past, and that special attention has been given to all details and improvements so as to keep them fully abreast of the times. They have increased their facilities for prompt shipment, and now have a switch running right into their factory so that they can load direct into the cars. They make special allusion to their patent frame construction as being strong and of attractive appearance, and possessing very ample space for storing pans, vessels, &c., besides being easily kept clean. The Quick Meal Giant burner stoves have been improved, and it is said that there is no more liability of the valve becoming leaky after continued use. The lighting cups of all the Quick Meal Junior burners have had added to them a device which acts to make the lighting of the flame smokeless and almost entirely blue. Allusion is made to improvements in the Quick Meal oil stoves. The various Quick Meal goods are thoroughly illustrated and described in the pages that follow, and tables of prices and sizes are presented. At the end is reference to lamps and torches, saucepans, toasters, steamers, &c. A feature of the catalogue is the running index which appears at the top of the pages and facilitates reference to the contents.

J. D Marvin has opened a fine salesroom at 170 Centre street, New York, where he is acting as manufacturers' selling agent for a variety of special lines, which he is presenting as the Star lines. Mr. Marvin has his office

in the front showroom on the first floor of his building, which he has covered with a handsome red carpet, and has arranged his Stoves at each side, and at the back has erected a pyramid of Stoves. Three ranges are placed across the corners at the bottom, and on a platform which goes up to the top of the ranges are two more ranges, and on a still higher platform is another range higher up, giving a very pleasing effect. In the rear of this salesroom Mr. Marvin has a large showroom and on the floor above he has another large space. The Star lines are composed of the Stoves, Ranges and Furnaces made by the Abram Cox Stove Company; the Gas Stoves and Ranges made by the Electric Gas Stove Company, Detroit, Mich.; the Blue and White Flame Oil Stoves made by the Electric Oil Stove Company of Homer, Mich.; the Belding Refrigerators made by the Belding-Hall Mfg. Company, Belding, Mich.; the Gasoline Stoves and Iron and Brass Bedsteads made by the Western Hardware & Mfg. Company, Milwaukee, Wis.; the Hurd Refrigerators made by the Hurd Refrigerator Company, Duluth, Minn., and the Clothes Wringers made by the Ohio Wringer & Lawn Mower Company, Springfield, Ohio. Mr. Marvin is assisted in his new venture by Walter Barry and E. A. Keating as associate salesmen.

Method for Obtaining Weekly Shop Costs.*

BY W. N. MOORE.

The necessities of shop management with reference to current cost records are that they be practically accurate, continuously formed as a running record, always up to date within the shortest possible interval, and that the method be direct and inexpensive. The plan here given for recording labor and material costs has been in use for some years in a stove foundry, and has met these requirements. The various operations of the shop are classified, grouped, and, so far as desired, designated by separate numbers, which are known as shop numbers and are also used to designate corresponding ledger accounts.

As a matter of convenience, certain numbers are reserved for what are known as standing shop orders, which relate to constant operations, such as Cupola Attendance, Unloading Material, Care of Boiler and Engine, Repairs to Building, Repairs to Flasks and Machinery, Warehouse Labor, &c. Other numbers are reserved for Molding, Mounting, Nickeling, &c. Numbers between 1 and 10 indicate General Labor items. Those between 20 and 30, Machinery and Power; 300 to 400 indicate Mounting Shop Operations; 400 and above are used for special jobs, done either on shop account or custom work. These reservations add a significance to the numbers themselves and facilitate their proper use.

The day worker is furnished with a card such as shown in Fig. 1. On it he records daily the number of hours employed, and makes his own distribution of the time

JOHN SMITH, ...No.....

Week ending 6-20-97

S. O.	M.	T.	W.	T.	F.	S.	Hrs.	Rate	Amount
372	9						9	2.25	2 02
37		8	9		9		26		5 85
63		1					1		22
342						9	9		2 03
Total.	9	9	9		9	9	45		10 12
A. M.									
P. M.									

Fig. 1.

against the single or several shop orders under which he has been employed during the day. These cards are taken out in the morning and returned at night. He also registers on a Bundy time clock. At the end of the week the time reported is checked by the time clock record. The cards are computed vertically and horizontally, so that a workman's distribution of time must be complete, and is checked by the time paid for.

For piece work, a similar form is used, shown in Fig. 2. The workman is provided with a duplicate card for his convenience, but the real record is made by the timekeeper and foreman, using the ordinary means of a gangway count and discount pile. This is cumbersome, but no better way has been found.

At the end of the week, the computations having been made, the cards collectively form a complete pay roll. But, for the sake of convenience, the items are carried

Name..... JOHN SMITH. .....Week ending 6—20—97

S. O. No.	Stove.	Board No.	M.	T	W.	T.	F.	S.	Total.		Price.	Amount.		Net.	
			23	23	23	19	24		112						
86	M H. 3B.	7	1	3	2		1		7	105	18	18	90		
						1									
84	Job w'k.								1		25		25		
														19	15
	86—18	90													
	84—	25													
	19	15													

Fig. 2.

forward and concentrated in a pay roll book in which are recorded the names of the workmen with the amounts due; and, under a separate tabulation, the various items shown on the card distribution are brought together under their common shop order numbers. The two sides of the pay-roll—the wages paid and the distribution—being in balance, the pay roll forms an accurate source from which ledger charges against the shop orders are made. These shop order accounts are carried in the ledger where they can be referred to when desired, and at the end of the year enter into an annual cost sheet with which we will not deal in this paper, but only with running records which are made and exposed as often as the pay roll is made up.

For the purpose of making ready comparisons, the weekly expenditures appearing in the pay roll under the various shop orders are then grouped under these headings: Superintendence, including watchman, power, &c.; General Labor, including yards, cupola, cleaning, grinding, &c.; Warehouse, Molding, Mounting, Nickeling, Repairs and Improvements. The castings made are of such uniform character as regards expenditures under the first three of these groups that such differences as exist are ignored. There are occasional exceptions where an undue proportion of gate, extra hazard from loss or breakage, or other conditions, require recognition, to fix individual costs. But for the purpose of this record these expenditures are charged uniformly against the product by weight, the basis of the charge being 100 pounds net production of finished castings, deductions being made for all returns to the cupola from whatever cause. The accuracy as to net product is insured by having all returned castings weighed back over the out scales and reported on the daily weight sheet. Liability to error is also decreased by having its weight plainly marked on each truck or barrow, and having the gross and tare both recorded.

A computation on the same basis is also made of the cost of molding, but as this is all done by piece work, and the cost per hundredweight naturally varies greatly according to the character of the work in the shop, the figures are only of general interest.

In the other departments—mounting and plating shops—where day work prevails, the natural costs of the various productions bear so little relation to their weights that comparisons on this basis would be valueless. There-

*Read before the Western Foundrymen's Association, at Chicago, Dec. 15, 1897.

fore, in ascertaining results being obtained in these departments there is first placed an arbitrary cost price, determined from previous experience, on each stove or piece produced. The weekly outputs of these departments are computed at these assumed costs, and the difference between this computation and the actual pay roll expenditure is shown as a percentage. This percentage of difference, either above or below the assumed cost of the weekly output, forms a very satisfactory gauge, both for making comparisons and ascertaining exact costs.

Those items in the pay roll which are grouped under Repairs and Improvements are not made a matter of weekly comparison, as expenditures in these directions are considered as arising more from general policy than from current shop management. They occupy a proper place in the yearly cost sheet.

Of the purchased material which enters into the production of castings, a comparative record of weekly consumption is kept of iron, coke and steam coal only. Iron and coke are weighed as they come up to the charging floor, and the daily weight sheet shows both the gross and tare of each load. Coal is similarly weighed to the boiler room. The materials so delivered are considered as consumed, although the actual daily consumption may only approximately tally. For obtaining an accurate record, this is found to be more reliable than a system by which the weighing is concurrent with the operation of charging, there being at most only a slight temporary inaccuracy in the weekly totals, due to the variation in the amount of surplus stocks which may remain on the charging floors at the weeks' ends. The weekly report shows the number of pounds of each of these several materials which have been used to produce 100 pounds of finished product. It also shows the total number of pounds melted, the returns of broken and discarded castings and the discount—each computed on the same basis.

The full report is as follows, the figures being entirely fictitious :

Week Ending January 1, 1898.

	Pounds.	
Net product	125,000	
Iron, per cwt. of product	94.4	
Coke, per cwt. of product	20.3	
Coal, per cwt. of product	5.7	
Total melt, per cwt. of product	157	
Breakage and obsolete, per cwt. of product	3	
Discount, per cwt. of product	4.5	
Group I.—Molding	$0.97	
Group II.—Superintendence, &c.	.124	
Group III.—General labor	.325	
Group IX.—Warehouse	.156	
Group V.—Mounting department	Gain, $32.50	9.7 %
Group X.—Plating department	Loss, 17.00	4.6 %

These reports are gotten out by Thursday, covering the operations of the preceding week. The remedial value of information of this character comes not only from knowing it, but from knowing it quickly.

The cost of clerical work involved in keeping this record, over and above that required for the simplest form of pay roll accounting, is not such as to affect its usefulness. The method has a natural fluency, one step following another in simple routine, and but little or no knowledge of the operations of the shop is required to carry correctly the original entries through to the conclusions.

Discussion.

W. Ferguson: I would like to inquire how long it took from the commencement of this system before you obtained satisfactory results ?

W. N. Moore: It has been in use for six or eight years. It proved satisfactory from its inception.

W. L. Thompson: While Mr. Moore says the figures in the paper are entirely fictitious, I would like to ask him if 94.4 per hundredweight is anything like the general average of casting produced from 100 pounds of melted iron.

Mr. Moore: I would answer that question by stating that the figures are entirely fictitious. They are not intended to convey anything as to actual results. At the same time if it had been 104.4 it would have made the table more nearly correct. That item is always in excess of 100 pounds. It takes more than 100 pounds to make 100 pounds of casting. Our records show that it takes about 104 pounds of iron to make 100 pounds of casting.

S. T. Johnston: I would like to ask Mr. Moore if he has the men extend the amount opposite their time ?

W. N. Moore: The men count their hours; the rest is done in the office.

O. T. Stantial: It is impossible for us to adopt any such system as this on account of the variety of work. It is all very well in a stove foundry or in a machine foundry, but where you are turning out all kinds of work you must keep special costs.

W. Ferguson: In the general foundry business we get cost per ton. Once after trying for 30 days to get a detail cost on every individual piece produced in the job we did not succeed. We were running at that time in the neighborhood of 130 molders, and hired a half dozen clerks to look after the system. I know now of another concern who get individual costs and they handle it in pretty good shape. From my own experience in the general foundry work I never saw the necessity for detail costs. It would cost more money to keep the system running than the gain therefrom is worth. In our system we divide the work into four classes. In the first class we put green sand, dry sand and loam work in the second class, hard iron in the third class and shop tools in the fourth class. The coremaker's time is taken for 30 days, and a report made on that basis always seems to me to be all that can be got out of it.

A. Sorge, Jr.: I cannot agree with Mr. Ferguson so far as the keeping of individual costs is concerned. It is not done merely for the purpose of estimating. A keeping of individual costs does give a record as to the expense; and, if it is done in a proper and systematic manner, it can be done with slight expense. I know where the keeping of costs for 120 molders involved the labor of one clerk. The individual cost of any piece produced in that shop was obtainable. As to trying a system of that kind for 30 days, I think our chairman will agree with me that that is not a fair trial. The longer it is kept up the more valuable it becomes. Methods can be judged much more accurately than by the judgment of an individual. Mr. Moore states that he gives a shop number to a certain stove: does that involve every piece of that stove or simply the stove entire ?

W. N. Moore: We do not have special shop numbers for the separate parts. There is a multitude of castings, and it would hardly warrant the effort to number each one separately. This description of our methods is not presented as one which is of general application. It was presented merely with the thought that it might possibly be of interest. The conditions in a stove foundry or in any shop making a specialty are of course radically different from those in a general foundry. It is not to be thought for a moment that a plan that will be satisfactory under one set of conditions is applicable to another set. In the three labor items, the Groups II, III and IX, especially Group III, a general labor item which includes the yard work, cupola and grinding, we have found a great variation. When we are running a large heat we need a large number of men, but when the heat is reduced two-thirds, then we have to drop off some of the men, and the practical value of knowing that is worth a good deal. The natural tendency in our shop is that when we are running a lot of men and the heat drops down to 40 or 50 per cent., we drop a man here and there, but we keep three-fourths or two-thirds of the men to do one-half or one-third of the work. A report of this kind brings that very forcibly to the knowledge of the office. There are some facts in connection with this method which might be of interest. If special work comes in from outside we attach a shop number to it. The cost of the casting we assume to be practically the same, but the other costs vary greatly. There are special shop numbers for those items and we enter them in the ledger accounts, and have them to ascertain the unusual cost on a set of castings. We can turn to the ledger at any time and find the actual expenditure on any class of work done.

W. Ferguson: Mr. Sorge states that the individual costs are not kept for the purpose of helping to make estimates on work. If it is not for an economical purpose wherein is there any benefit to be gained from the system ? I cannot see anything except a knowledge of the whole working of the concern being placed in the hands of the head of the concern instead of in the hands of the foreman or superintendent and left to his management.

A. Sorge, Jr.: It is not merely for the purpose of estimating, but certainly it is concerned in the estimating and does help in the reduction of costs, and is of as great importance in the very thing that our chairman brought out as anything, that of informing the head of the concern of the workings of the shop.

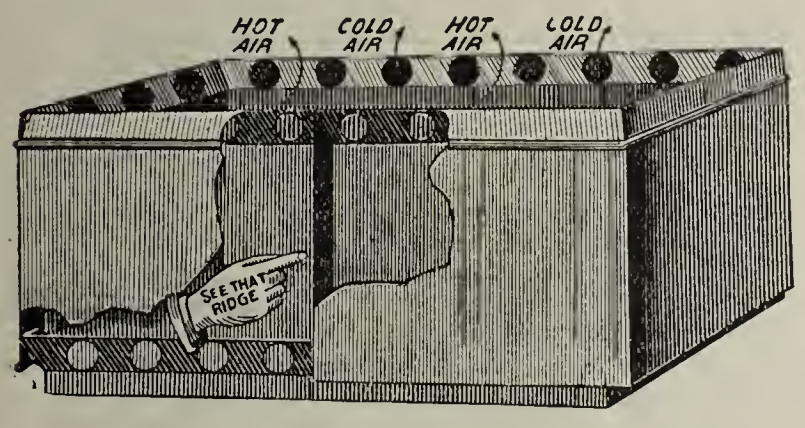
New Process Blue Flame Oil Stoves

are considered in an interesting way in an attractive catalogue which has just been issued from the press by the Standard Lighting Company of Cleveland, Ohio. These goods are for the season of 1898, and embrace not only the Blue Flame oil stoves, but also New Process oil heaters, torches, Globe incandescent lamps, toasters, ovens, &c. In presenting the catalogue to the trade the manufacturers call attention to the many "new and valuable features embodied in the present construction of the New Process Blue Flame oil stove." Reference is made to the safety and convenience of this form of construction, the economy resulting from its use, its durability and its attractiveness. The statement is made that the New Process Blue Flame oil stove is easy to understand, and as complete instructions accompany each stove the manufacturers urge both dealers and users to familiarize themselves with the directions before starting the stove in operation. As a rule the mistake is made of trimming the wicks too much, thus needlessly destroying them. No portion of the wick, the makers state, should be removed except the free carbon that collects on its upper edge. The charred portion of the wick proper should not be

disturbed or removed. All stoves are carefully tested for leakages and imperfections before shipping, the tank being detached before the goods are sent out, thus removing all strain while in transit and preventing any consequent development of leaks. The little catalogue is printed in a very attractive manner and is bound in colored paper covers, with a blue panel in the shape of a shield carrying the name and address of the company and an indication of the contents of the pamphlet.

The Rome Ventilated Wall Pipe.

In the accompanying illustration we show a section of the Rome ventilated wall pipe, made by George Rome & Co. of Carnegie, Pa. Special machinery is provided for the manufacture of the wall pipe, elbows, boots, register boxes, offsets, tees and reducers and other fittings required in hot air furnace work, so that the work is completed without the use of solder. The illustration shows an inner hot air pipe and an outer casing with an air space between, provided with perforations in the end caps to insure a free circulation of air. In order to prevent the collapse of the inner or outer pipe a ridge is placed at the center of the pipe, which can be seen in the broken view presented. This ridge is provided in all of the fittings made, as well as the entire length of the heating pipe. A special feature of the pipe and fittings is the dovetail connection and the perfect fit provided by the method of making the end cap, so that in erecting the work no time is lost through difficulty in making connections. The Rome pipe and fittings have, we understand, been used largely in the vicinity of Carnegie with highly satisfac-



The Rome Ventilated Wall Pipe.

tory results. The Rome goods have been brought to the attention of a number of architects, building inspectors and fire marshals, and are said to have met with their approval without exception. The firm will be glad to furnish circulars and prices to those who are desirous of becoming acquainted with the pipe, and will also furnish a short section of the pipe, so that the construction and the method of fitting the ends of the sections may be more fully understood.

Range Manufacturers' New Open End Brake.

To meet the demand for improved machinery made necessary by the advances in the manufacture of ranges, J. M. Robisnon & Co., 325-331 West Second street, Cincinnati, Ohio, have brought out an improved four-foot brake for the expeditious work of bending and flanging, in addition to which a four-sided figure can be bent with a continuous operation at the conclusion of the fourth and last bend, and can be removed from the upper end of the top clamp without marring its shape.

The top and bottom clamps and bending leaves are the three principal members of the machine. The top clamp, which is stationary, is for all ordinary bending and flanging; the bottom clamp, to which the bending leaf is journaled, is operated by two eccentrics, the peripheries of which come in contact with the under side of the bottom clamp, and by a movement of a lever, secured to the shaft on which the eccentrics are keyed, the bottom clamp will rise in a parallel line with the face of the top clamp and clamp the material with a powerful pressure, thus making it impossible to move with the application of the force required to bend it. To one end of the eccentric shaft opposite to the lever is secured an eccentric around which is a yoke, the upper end of which is linked to the left hand end of the top clamp. Having made the fourth and last bend to a four-sided figure, the top clamp is secured at the right hand end with a journal screw, with a two-armed nut on top coming in contact with the clamp. Releasing the nut will let the screw swing down out of the way, and a backward movement of the lever on the eccentric shaft will cause the top clamp to swing upon its journal near the left hand end, in which position the completed work is free to be removed. A reverse movement of the lever will return the top clamp, when it can be secured with the two-armed nut and screw. Another valuable feature referred to is that the top clamp is adjustable for light and heavy material, sharp or round corners. The brake is not complicated in its movement, and the one lever on eccentric shaft does the clamping and raising of the top clamp. The eccentrics are adjustable for more or less pressure and any wear that may occur. The width between the clamps when wide open is 1 inch or less, according to the movement of the eccentric lever. These new features, in combination with adjustability, quick movement, and the ease with which the brake can be handled, fulfill, the manufacturers point out, the requirements for the rapid manufacture of family ranges, while its comparatively low cost brings the brake within the reach of all who desire to bend soft sheet steel of No. 14 gauge or lighter in 4-foot lengths or less.

ODD PLATES.

Vanfleet & Nixon of North Wales, Pa., are about erecting new Stove works on Seventh street, Lansdale. The main structure is to be 30 x 48 feet, while the foundry will be 20 x 40 feet. John Kauflie has the contract for erecting the buildings, which will cost $5000, and will be situated on the Doylestown branch of the North Pennsylvania Railroad.

J. Bramley Oldershaw has acquired an interest in the Rapid Transit Stove & Furnace Company, Baltimore, Md., and the business will be conducted under the name of J. B. Oldershaw & Son, proprietors.

The Griswold Mfg. Company, Erie, Pa., were recently chartered, with a capital of $100,000, to manufacture Stoves and Iron Ware. The directors are M. Griswold, M. Griswold, Jr., M. E. Griswold and L. G. Selden of Erie, Pa., and M. Griswold of Lyme, Conn.

The Walker & Pratt Mfg. Company of Boston, Mass., closed their foundry at Watertown for a week on December 24 for the purpose of taking annual inventory and making such repairs as were found necessary. The company's new plant at East Watertown is now ready for occupancy, and it was hoped that they would be able to take possession immediately after the Christmas shut down. Owing to the press of orders, however, it is not expected that the removal will take place before the middle of February, when the work on hand is finished.

The following interesting item is taken from a New York paper: "A Detroit Stove manufacturer declares that English manufacturers buy a few American Stoves, and then steal the patterns and make a clumsy imitation of our Stoves for themselves. They are now using Stoves in England after the American patterns of four or five years ago."

George Rome & Co., Carnegie, Pa., are bringing to the notice of architects and Furnace dealers the Rome Ventilating Wall Pipe by means of an attractive calendar which they are distributing. The calendar carries on the card on which it is mounted a fine engraving showing the interior of a German cottage, while below it is a cut illustrating the special features of the Rome Pipe, and a brief description of the Pipe is likewise presented. The firm also make Galvanized Cornices, Finials and Skylights, and do tin and iron roofing.

One of the most tasteful souvenirs of the season that has reached our desk is the calendar for 1898 which the Presbrey Stove Lining Company, Taunton, Mass., are sending out. The main feature of the calendar is a beautiful art study of wild flowers mounted on a decorated card, 14 x 11 inches in size, and hung by a white silk cord. The name of the concern is inscribed in gold letters at the top and the calendar proper is attached by silken cords to the bottom of the card, a leaf being devoted to each month of the year.

The Champion Furnace & Stove Company were organized at Springfield, Ohio, on December 29, for the purpose of manufacturing Stoves, Ranges, Gas Burners, &c. The new concern are successors to the Dayton Furnace & Foundry Company. The president is S. W. Martin; vice-president and treasurer, T. D. Wallace; second vice-president, J. F. Carpenter, and secretary, I. F. McNally.

The Edward Miller Cornice & Roofing Company, Tacoma, Wash., have designed a Camp Stove for the Alaska trade and already, we understand, have more orders for it than they can fill. The name of the Stove is the Brotherhood Klondike.

In *The Metal Worker* of December 25 we mentioned the incorporation of the W. L. Armiger Mfg. Company, Baltimore, Md., as successors to W. L. Armiger & Co. The firm, however, are to engage in the manufacture of Refrigerators and not in the manufacture of Stoves, as we stated. The new concern will continue the wholesale or jobbing Stove business formerly conducted by W. L. Armiger & Co. in connection with the manufacture of Refrigerators, but will not operate a foundry.

The envelopes used by William H. Hill announce him to be the sole agent for the Magee Furnaces and Ranges at Marlboro, Mass., and with this envelope announcement is printed a half-tone engraving of the gentleman in question, the portrait proving beyond all doubt that Mr. Hill possesses that great and admirable quality of good nature. However, we must not linger too long upon the envelope used by Mr. Hill, but say a word about a New Year's card that he is sending to his friends. It has a very neat address made from the text of an actual piece of taffy candy, done up in tin foil and fastened to the card. How any one after eating this most delicious piece of confectionery can have any doubt of the truth of all Mr. Hill says, or can question the sincerity of his mellifluous good wishes, is more than we can understand. Any one interested at all in the Magee Furnaces and Ranges, or taffy, should send to Mr. Hill for particulars.

In a special extra number descriptive of and illustrating Troy, N. Y., the *American Journal of Progress* presents a brief outline of the leading industrial establishments, among the number being the Vedder Pattern Works, located at the corner of River and Hoosick streets, in the city named. The enterprise had its inception in 1835 and later N. S. Vedder became the proprietor. He was succeeded by Bascom, Galbraith & Co., and in 1884 H. Clay Bascom became sole proprietor. On December 13, 1896, he died and the business has since been conducted by the estate, with Chester Bascom as manager, Mr. Galbraith remaining, as heretofore, at the head of the mechanical department. The present works were those formerly occupied by the Eddy & Corse Stove Foundry, and are equipped with all the latest steam power machinery and appliances for the manufacture of Wood and Iron Patterns, Stove Work, Hot Air Furnace, Radiator Patterns, &c.

In addition to the list of their traveling salesmen given in our issue for December 25, 1897, the S. M. Howes Company of 40-46 Union street, Boston, Mass., announce that Fred Hall will look after their interests on Cape Cod and contiguous territory.

Schill Brothers of Crestline, Ohio, have issued an attractive calendar of the poster form, which will be appreciated by all dealers who receive it. The figures are large, and as they are printed in a dark color upon a white ground they can be readily seen at a distance. The moon's phases are given in connection with the days of the week and month. In presenting their annual calendar to the trade the manufacturers state that their sales of Furnaces and Ranges during 1897 were the largest in the history of their business, and notwithstanding several additions to their plant the past two years they were unable to keep up with the demand. They also state that ever since 1892, when they commenced the manufacture of their well-known New Idea Furnace, their sales have increased year by year, and the Furnace is to be found to-day in nearly every State in the Union where Furnaces are employed for heating purposes. The manufacturers contemplate still further increasing their producing facilities and hope to be able in the future to keep up with the demand.

We have received from Isaac A. Sheppard & Co., Philadelphia, two illustrated cards printed in colors, which are well calculated to direct the attention of those who receive them to the Paragon Furnaces and the Excelsior Ranges.

F. M. Borden & Brother, 118 North Second street, Philadelphia, Pa., are already bringing to the attention of the trade the Novelty Blue Flame Oil Stove which they are making a specialty of this year, and also the New Process Gasoline Stove. Morris Borden is now making a trip in the South showing these goods, W. F. Habicht is visiting the dealers in Pennsylvania and C. B. Smyth is traveling in New Jersey.

F. Sabin, 121 North Second street, Philadelphia, Pa., has a fine large showroom in which he is displaying the Active Fortune Ranges and Hot Air Furnaces, which goods have had a long and successful run with the building trades in that vicinity.

Manager J. C. H. Lynn of the Danville Stove & Mfg. Company, 107 North Second street, Philadelphia, Pa., has an attractive display of the Beaver line of Ranges and Parlor Heaters, and the trade in Pennsylvania is now being visited by H. Harfield, and that in Delaware and Maryland by W. E. Pharo.

John R. McKnight, manager of the Philadelphia office of the Mount Penn Stove Works, 113 North Second street, reports a good trade on the Penn Coin, Penn Pride and Penn Pearl Sheet Iron Stoves of the direct draft, half revertible and full revertible flue types, made with clay fire chamber and sheet iron body. These Stoves are attractive in design and provided with handsome nickel trimmings. He is also showing a fine line of Square Heaters in the Penn Oakland, and a very successful Double Heater of the sheet body type in the Penn Ruby. One of his newest attractions is the Penn Esther, a large, handsome Range provided with all of the modern conveniences.

E. F. Kurtz, 43 North Second street, Philadelphia, Pa., is preparing to bring to the notice of the trade the Quick Meal line of Blue Flame Oil Stoves, Gasoline Stoves and Steel Ranges. C. S. Stevens is about starting on a trip through Pennsylvania, and W E Hopkins for a trip in the South. The line of Stoves made by the Buckwalter Stove Company of Royersford, Pa., is the line of coal goods which he handles

The Loyal Victor, one of the newest Ranges put out by the Leibrandt & McDowell Stove Company of Philadelphia, Pa., is of handsome design and finish and provided with all the conveniences necessary to qualify it to stand in the front rank. The circular distributed by the house says that it is made in 48 sizes and styles, and one of the pictures shows the body of the Range and displayed in front of it are the various parts which time and experience have proven liable to need replacing, showing that it is a simple matter to renew any of the parts compared with the labor that was necessary with the Stoves of an early date.

A miniature United States mail box, in the orthodox red color, calls attention to the new departure of the Monarch Stove Company, for whom A. L. Canfield, 284 Pearl street, New York, is manager. The announcement alludes to their large showrooms and warehouse and their facilities for prompt shipment, and gives a list of some of the new goods for 1898 which they are putting out, besides emphasizing the merits of the Monarch oven.

Rufus Van Valkenburgh, representing Eugene Munsell & Co., New York City, Stove founders and miners of Mica, sends a novel and interesting announcement to his friends in the trade wishing them all joy for the coming year. The card is tastefully designed, and will be read with interest.

W. G. Henry, secretary of the Detroit Stove Works, has succeeded W. M. Shaddinger as manager of the company's branch house at Chicago. Mr. Shaddinger retains his official connection as second vice-president.

R. L. Morley, associate manager of the Michigan Stove Company, Chicago, is again at his desk, having returned from his trip to Europe last week. He made but a short stay, having sailed the latter part of November, and not having gone for personal pleasure. His trip was uneventful, no seriously rough weather having been encountered either on the outward or inward passage.

Bergstom Bros. & Co., Neenah, Wis., are distributing artistic wall calendars with heavy paper backs, embossed in gilt and brass bound. The monthly sheets are of large size, with very distinct figures.

A combination has been arranged of some 20 of the largest concerns operating the fresh water fisheries of the Great Lakes. The amalgamation is taken over by an English company, capitalized at $5,000,000. The new organization will control the distribution of about 150,000,000 pounds of fish a year and will operate cold storage plants in a number of the principal cities.

A tremendous rush of applications was experienced during the closing days of the year at the Patent Office in Washington, the number filed exceeding the highest on record for the season in the history of the office. The fact that the new law, requiring persons who have made applications abroad for patents to file their applications in this country within seven months of the filing of the application for a foreign patent, became operative January 1, is accountable for the rush. Heretofore applications could be filed at any time within the life of a patent issued in foreign countries.

After a lengthy trial a verdict was returned last week in Judge Seaman's Court, in Chicago, in the breach of contract case of the Columbus Construction Company against the Crane Company, awarding $98,086 damages to the Crane Company. The basis of the suit was an alleged breach of contract upon the part of the Crane Company, who had secured the contract for furnishing the pipe for the line of the Indiana Natural Gas Company, between the latter's wells and Chicago. The Columbus Construction Company originally claimed $1,000,000 damages, but later reduced this to $200,000. The Crane Company brought a cross damage suit for $130,000. The trial just concluded was the third and, besides, the case has twice been through the Court of Appeals.

The California Miners' Association are preparing resolutions for presentation to Congress in favor of the creation of the Cabinet office of Secretary of Mines and Mining. The resolutions will be sent to the American Institute of Mining Engineers and to the Federation of Miners for their indorsement.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Little or nothing more than ordinary business has been effected. Consumers and the distributing trade purchased very conservatively, and no speculative interest has developed despite the officially recorded change in the statistical position. The latter places the visible supply for Europe and America on the 1st inst. at 29,855 tons, against 31,037 tons on November 1, and 32,342 tons a year ago. The market maintained a firm tone, however, and prices showed no change. Jobbers continue to quote small lots of Straits Pig from store at 4½c. to 4¾c. per lb.

Copper.—Neither export nor home trade buying has been of remarkable volume, but a very good business takes place quietly and sellers hold more or less firmly to full former prices. It is figured out that the December exports amounted to 10,305 tons, making a total of, in round numbers, 123,000 tons of fine Copper for the entire year. In the face of this heavy movement and the large American production, the European visible supply has decreased to 32,000 tons, leaving what may be termed a healthy statistical position. Under the circumstances prices hold quite steady here. In a retail way business during the week has been of very limited proportions, and dealers' prices for small lots are unchanged at about 12¼c. per lb. for Lake Ingot and 11¼c. for Ansonia Grade Casting Copper.

Sheet Copper.—Consumers' orders have been confined, as is usual in the first week of the year, to small lots for current needs. The larger users of Sheet Copper have not yet figured out their probable requirements, but the amount of inquiry during the last few weeks indicates the probability of a good sized demand in the near future. Competition for orders is somewhat sharp and prices for Sheet Copper are hardly as firm as for the raw material. Small lots from stock are quoted nominally at 15c. per lb., basis, but this price is not infrequently shaded on desirable orders.

Pig Lead.—Business has been slow throughout the week, and the market is at present in a flat condition, with orders of a very moderate type. Improvement is looked for, however, as soon as consumers and dealers have figured out their requirements. Prices, while somewhat weak, show no quotable change. Jobbers quote small quantities of American Pig at 4⅛c. to 4¼c. per lb.

St. Louis advices are as follows: The market is dull, but prices are firmly maintained. The demand is expected to improve shortly, especially as consumers are known to be carrying light stocks, and some improvement in the price is also anticipated.

Lead Pipe and Sheet.—As noted in another column, the Eastern manufacturers of Lead Pipe and Sheet Lead have reduced the price of these materials ¼c. in the lb. Jobbers now quote Pipe at 5½c. and Sheet at 6½c., subject to the customary trade discount of 20 per cent. Sales have been on a very moderate scale in the past week, orders being almost solely for spot goods for present use. A better business is looked for as soon as concerns have completed their stock taking.

Spelter.—The demand is very tame, and as offerings are rather freer the market has relapsed into weakness. Retail prices for good Western brands in small lots are quoted by dealers at 4.40c. to 4½c. per lb.

St. Louis advices indicate no change in this metal. The demand in that quarter is only fair and sellers are offering large lots at a reduction from last week's prices, without finding many takers.

Antimony.—Sales have been fair and prices remain steady at about 7¼c. for Japanese, 7½c. for Hallett's and 8½c. for Cookson's in small parcels from store.

Nickel.—The market is easy at about 38c. per lb. for retail quantities.

Tin Plate.—The first week or two of a new year are at all times regarded as dull ones in the Tin Plate trade. Stock taking is in progress and calculations are being made by dealers and consumers as to future requirements. Consequently the run of sales has been small during the past week. Nevertheless, some fair sized contracts were placed for American Cokes for deliveries extending into the second quarter of the year. The prices at which these orders were taken are said to be low, however, and the tone of the wholesale market is not as strong as it might be. This is somewhat surprising, as a number of the mills are sold up to May and available stocks of Plates are by no means heavy. The prospect of a large additional output this year is undoubtedly the depressing influence in the market. But, as has been pointed out several times in these columns, this additional capacity will not be much of a factor until after the middle of the year and, meanwhile consumers will have to get their orders for the year's supply filled from the present active mills. When this fact is appreciated by buyers there is likely to be a great stimulus to the demand, which should tend to stiffen prices. The retail trade has been dull, with sales confined to small lots for current use. The trade are interested in the meeting of the manufacturers' committee this week in Pittsburgh, as it is rumored that efforts were likely to be made to advance prices to a more profitable level by means of an agreement among the makers such as was made last year. Jobbers' prices for small lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are quoted about as follows, but these rates are being shaded in some quarters: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3 60; do., 100 lbs., $3 40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates remain very quiet and unchanged.

Sheet Iron.—While orders have been rather scarce during the holiday weeks, there is said to be a large amount of figuring going on on contracts for deliveries extending up to the middle of the year, and a heavy demand for Sheets is looked for during the early months of the year. Mills, however, are showing a disposition not to sell for delivery beyond the first quarter, believing that prices may improve when the spring trade opens. Meanwhile, the market for spot goods is hardly firm. Jobbers' sales have been very light. Small lots from stock are quoted at about 2.35c. to 2.40c. for No. 27 Common Black Sheets, and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: Manufacturers who can make the deliveries find a good trade for carload shipments this month and February in both Black and Galvanized Sheets. Small lots from stock are held at 2.20c. to 2.25c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—There has been a slight improvement in the demand and inquiries indicate a better business as the month progresses, both from domestic and foreign consumers. Meanwhile prices are unchanged. Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here:

Heavy Copper	per lb.	9 c.
Light and Tinned Copper	per lb.	8 c.
Heavy Brass	per lb.	5¾c.
Light Brass	per lb.	4¾c.
Lead	per lb.	3½c.
Tea Lead	per lb.	3¼c.
Zinc	per lb.	2¾c.
No. 1 Pewter	per lb.	8 c.
No. 2 Pewter	per lb.	4½c.
Wrought Scrap Iron, per gross ton		$10.50
Heavy Cast Scrap, per gross ton		9.25
Stove Plate Scrap, per gross ton		5.25
Burnt Iron, per gross ton		5.00
Tin Plate Scrap, per ton		4.50

The citizens of Greenville, Pa., have purchased $15,000 worth of bonds, this being the amount necessary to insure the starting of the Greenville Rolling Mills of P. L. Kimberly & Co. at that place. It is probable the plant will be started this month.

The Excelsior Stamping & Metal Company of New York City have been incorporated, with a capital of $30,000, to manufacture Metal Ware. The directors are Seuder Jarmulowsky, Meyer Jarmulowsky and Louis Jarmulowsky of New York City.

THE IRON MARKET.

The tide is rising surely, although almost imperceptibly. The main channel is full and we may soon find the river overflowing its banks. In many branches, notably in the cruder forms, the rush for winter work is over and the leading sellers are well filled with orders for the next three to four months to come. The business has been taken at low prices, modestly remunerative to the best equipped and located works, and for some time to come they will probably remain indifferent, willing to let events shape their course until buyers again come into the market. The conviction now is quite general that by that time sellers will be in a position to demand an advance.

Concerning the Wire consolidation there is very little that is new. It is understood that the work of the appraisers and accountants is progressing more rapidly than was expected, and that there will be a gathering of those interested in this city during the close of the current week. The application for an Illinois charter, with a capital increased from the original $70,000,000 to $87,000,000, indicates that some large interest must have been added to the first coterie. The sum is suggestive.

In the Central West the makers of Billets are booked well up to May, and the only activity recently has been in Sheet and Tin Plate Bars, which show a stiffening tendency.

Considerable additional business has been done in Philadelphia in Foundry Iron, and at other points round blocks have been sold to Pipe makers. On the whole, in the East the market has settled somewhat. Along the belt west of the Alleghanies, where Southern and Northern Irons struggle for supremacy, there is still some irregularity and the largest buyers are still skirmishing.

Pig Iron.—There has been some local buying in the New York market of round lots by Pipe works, and there have been sales to Malleable works aggregating about 8000 tons. There is quite a good run of small orders. We quote as follows: Northern brands. No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.75; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

Advices from the Philadelphia Pig Iron market are as follows: The prominent feature during the past few days has been the steady absorption of low grade Iron by the Pipe founders. It is asserted that not less than 50,000 tons has been taken by one firm, besides which a considerable amount of Iron has been engaged by smaller concerns. Prices have been very low in these transactions, yet general quotations are fairly maintained on the usual run of business. Looking at the matter from a seller's standpoint, it may not be very inspiriting to contemplate sales of so much Iron at low prices, but they have unloaded a great deal of material, and are now in better position to present a firm front on whatever business may now be offered to them. The year opens with extremely low figures, but taking all the circumstances into consideration the situation is full of encouragement, and in course of a few weeks it will be strange indeed if prices have not developed a new upward tendency. For the present seaboard quotations are about as follows, subject to the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.25; No. 2 X Foundry, $11.25 to $11.50; No. 2 Plain, $10.75 to $11.

Seldom, if ever, has a year opened with brighter prospects in the Chicago market Numerous inquiries are in the market, and the month is likely to see a large tonnage closed. The business of the past week was more than fair, including sales of both local and Southern brands. The slight weakness in some Southern Irons is likely to disappear speedily with the good demand now in full swing. Stocks of Iron at Southern furnaces are stated to be lower than they have been at any time for six years. The leading Southern companies maintain a firm attitude, and their agents are instructed to refuse any concessions whatever. The local furnaces are now so well sold up for the first half of this year that it would not take much more business to completely cover their capacity. The Charcoal Iron trade continues quiet. We quote for cash as follows:

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.00 to 11.50
Southern Coke, No. 1	10.75 to 11.25
Southern Coke, No. 2	10.35 to 11.00
Southern Coke, No. 3	10.10 to 10.60
Southern, No. 1 Soft	10.75 to 11.25
Southern, No. 2 Soft	10.35 to 11.00

The Pig Iron market in Pittsburgh has been very quiet, but prices are firm. Foundry Irons show no change. Quotations f.o.b. Pittsburgh are as follows: No. 1 Foundry, $10.50 to $10.75; No. 2 Foundry, $10.10 to $10.25; Bessemer, $10 to $10.15.

In the Cincinnati district there has been a moderately fair run of new business, made up mainly of small orders, with some very fair sized lots helping to swell the total. There is but little in the indications to justify weakness on the part of furnaces, yet the market is unquestionably soft in some places. There are quite a number of buyers in the field, all seeking to force the market down and holding off in an aggravating manner when concessions are not granted. There has been some activity in Northern Irons, with evidence that the furnace interests up there need a vigorous tonic to give strength to their situation. Quotations are as follows, f.o.b. Cincinnati:

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to ....
Southern Coke, No. 3	9.00 to . .
Southern Coke, No. 1 Soft	9.75 to ....
Southern Coke, No. 2 Soft	9.50 to ....
Southern Coke, Gray Forge	9.00 to ....
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to $13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

The month of December was the heaviest, so far as volume of business is concerned, which the St. Louis Pig Iron trade have experienced for years past. It is true that in some cases concessions were made to induce the placing of orders, but in no case did it amount to more than 25c. per ton, and in most cases was even less than this figure. Prices have eased off somewhat during the past ten days, and the entire list shows an average decline of 25c. per ton. The outlook for January is considered excellent. Furnaces have no stocks to draw from, and many of them are sold up several months ahead. Consumers are specifying for their Iron, and a number of instances are known of shipments being asked for before they were due. The consumptive demand in all lines continues to be heavy, and nearly all the foundries have enough work on hand and in sight to anticipate a continuance of the activity for the next 90 days if not longer. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.25 to $10.75
Southern, No. 2 Foundry	10.00 to 10.25
Southern, No. 3 Foundry	9.75 to 10.00
No. 1 Soft	10.00 to 10.25
No. 2 Soft	9.75 to 10.00

CHICAGO REPORT.

Scrap.—A little inquiry for Old Material is making itself manifest and is regarded as the forerunner of an early revival in the demand. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9¼c.
Red Brass	....	8 c.
Yellow Brass	....	6¾c.
Light Brass	....	4½c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—Trade is dull and prices are still being made under the card rate. The card on carload lots of 12 tons minimum is as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.35	$5.60
Milwaukee, Wis	5.35	5.60
Kansas City, Mo	7.35	7.60
Council Bluffs, Iowa	7.35	7.60
Lincoln, Neb	7.50	7.75
Sioux City, Iowa	7.85	8.10
Aberdeen, S. Dak	8.60	8.85
Dubuque, Iowa	6.65	6.90
Madison, Wis	6.85	7.10
St. Paul, Minn	7.85	8.10
Burlington, Iowa	6.85	7.10
Des Moines, Iowa	7.35	7.60
Davenport, Iowa	6.65	6.90
St. Joseph, Mo	7.35	7.60
Leavenworth, Kan.	7.35	7.60
Omaha, Neb	7.35	7.60

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo.	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

While the trade have entered upon the new year they are still largely occupied with the business of 1897, taking inventory, closing the books and estimating the results of their activity and enterprise. Many of them are able to recognize the advance which the past year made over its predecessors and are congratulating themselves on somewhat increased profits. The new conditions, however, while unmistakably better, have not as yet given to many houses the desired measure of prosperity, and a retrospect of the past calls for careful scrutiny as to the methods adopted with a view to discovering the mistakes which have been made, cutting off expenses, finding new channels for business and introducing a general and better system wherever needed in store or factory, so as to make the business of the year more profitable and satisfactory. Every wise merchant or manufacturer will endeavor to adapt his business methods to the changing conditions of trade, or will be likely to find that he is being left behind in the race. In addition to many minor matters which deserve careful attention there is little doubt that the past year has been characterized by some features of especial significance. Among these the prominent place which department stores are assuming cannot be overlooked. The effect of their activity and enterprising methods and of the favor with which they are regarded by so many is felt by many merchants; while in this comparatively new field manufacturers and jobbers are finding a ready market for an increasing variety of goods. The system adopted by what are called catalogue or supply houses is also a disturbing influence in settled and old time business methods. In both of these matters the indications would seem to point to an increase rather than a diminution. What their influence will be upon trade finally remains to be seen, and it becomes all classes to look the matter fairly in the face and meet the new problems intelligently and energetically. During the past year there has been an evident tendency toward organization among the retail Hardware trade, and several States have associations in good working order. In others the matter is under advisement, and it is anticipated that organizations will soon be formed. Among the matters which have prominent place in the deliberations of these associations are the department stores and supply houses alluded to above, and many intelligent Hardware merchants are considering the question as to the measures which it is feasible to adopt to correct these disturbing influences. The different associations of the jobbing trade, who are especially well organized, are regarded as having had a satisfactory year and doing a good work in the cultivation of fraternal feelings and the inculcation of good business methods. During the year past there has also been, on the whole, something of a shrinkage in values in Hardware and related products, and the tendency toward lower prices has continued. Whether this is to go further or be checked by better business conditions and a large demand remains to be seen. In good measure, as a result of the low prices which have become prevalent, together with the enterprise of American manufacturers and the adaptation of their wares to foreign markets, there has been during the year a marked increase in the volume of foreign business. The extent of our general export trade is one of the gratifying features of the situation, and the large place in such exports held by Iron and Hardware products is a matter for special congratulation to the readers of this journal. The indications would seem to point to a much larger and more rapid movement in this direction, making the securing of foreign trade an object deserving the attention of manufacturers whose wares are such as to find a market abroad. This, with the outlook for excellent business at home, renders the prospect for 1898 specially encouraging.

Advices from Chicago.—General business in Shelf Hardware, Tinware and Metals opens up well in the new year, notwithstanding the fact that some jobbing houses are still entertaining their travelers at home. The orders being received by mail are of a very good character, indicating a tendency to keep up full stocks. A better movement is reported in staple goods, especially Wire products. The improving prospects for the consolidation of Wire interests are at last having an effect on the retail trade, who are beginning to purchase in carload lots. A special feature of local business is the very heavy demand for Galvanized Garbage Pails and Ash Cans, owing to a new city ordinance now going into effect requiring such receptacles by all householders. Manufacturers are hardly able to supply the trade within the limited time required. A good movement is reported in Heavy Hardware. The demand is excellent for Iron and Steel, and contracts are being placed for materials by certain classes of Agricultural Implement manufacturers.

Advices from St. Louis.—The Hardware trade opens up with a bright prospect. The month of December was very satisfactory and the reports received from salesmen who are now on the road indicate that the present month will prove equally if not more satisfactory than the one just closed. The recent advance in Screws is being firmly maintained. Wire Nails have also been advanced and slight advances have been recorded in Galvanized and Black Sheets. The trade do not hear much of the proposed consolidation of the Wire interests and are inclined to think that the matter will not go through. When it is remembered, however, that the work of appraisement cannot be done in a day or a week, opinion in this direction will probably change somewhat. The demand for Heavy Hardware is very large and an unusually heavy inquiry is reported for Builders' Hardware and Mechanics' Tools generally. Collections are quite satisfactory.

NOTES ON PRICES.

Wire Nails.—During the past week the demand has not been active, but prices have been steadily maintained. Manufacturers are refusing to accept orders except for early delivery at the present prices. The tone of the market is decidedly firm in view of the prospect for a successful consummation of the negotiations for the control of Wire interests.

Advices from Chicago.—Manufacturers report exceedingly heavy shipments in December, which probably witnessed the largest output of Wire Nails in the history of the trade. Heavy inquiries are being received, but in most cases buyers desire deliveries extending further than manufacturers are willing to grant. Jobbers quote small lots from stock at $1.60 and report a good movement. The retail trade is at last beginning to purchase larger quantities, and carload orders are becoming a feature.

Advices from St. Louis.—The market continues to show steady improvement and prices are being firmly maintained. Manufacturers are not inclined to fill their order books too full, but on the other hand are refusing business except for delivery during the current month. Jobbers report a satisfactory trade and quote $1.60, base, for small lots from store.

Cut Nails.—There is very little doing in Cut Nails, but it is anticipated that with the resumption of business activity when the trade of the new year is taken in hand there will be a good demand. Stocks generally are regarded as low. Quotations remain unchanged.

Advices from Chicago.—The demand is running about the same as it has for a long time, with small lots from stock selling at $1.45.

Advices from St. Louis.—The market is without any material change. Jobbers ask $1.45 to $1.50, base, for small lots from store.

Barb Wire.—The volume of business in Barb Wire is moderate, but the tone of the market is strong and the anticipations of the manufacturers are that a heavy business will be done this season.

Advices from Chicago.—Practically no stocks are in manufacturers' warehouses, which is quite unusual at this time of the year. It shows how heavy the shipments have recently been. A good trade is in progress, but quotations are still being made for immediate delivery only. Small lots are selling at $1.60 to $1.65 for Painted and 30 cents advance for Galvanized.

Advices from St. Louis.—There is not much doing in this department. Mills are not disposed to accept business for anything but immediate shipment. Jobbers report a fair demand and quote small lots of Painted at $1.60 to $1.65, with 30 cents per hundredweight added for Galvanized.

Smooth Wire.—The volume of business is not heavy, but the market is steady and strong.

Screws.—Since the concerted action taken by the manufacturers of Wood Screws, as announced in our last issue, the Screw market has been in excellent condition, the new prices being adopted by all the makers and received with approval by the trade as a reasonable advance on prices which had been unduly low. The manufacturers also refer to the fact that much less than the usual quantity of goods was purchased just prior to the advance, as a conservative policy was pursued by most of them,

and the trade were indisposed to buy in a speculative way. The fact of the advance coming as a natural reaction from unprofitable prices is having a good effect on the market at large.

Russell & Erwin Mfg. Company.—A discount sheet has been issued by Russell & Erwin Mfg. Company, New Britain, Conn., and New York, giving the revised quotations on Wood Screws and the new lists and discounts on Machine Screws, Iron and Brass, and current prices on Tire and Stove Bolts, Wire Nails, &c.

Machine Screws.—Under date January 1 the manufacturers of Machine Screws issue the following revised lists, which are subject to discounts as below :

	Per cent.
Round Head Screws, Iron or Brass	60
Flat Head Screws, Iron or Brass	60
Fillister Head Screws, Iron or Brass	50

Circulars announcing the adoption of the new lists and discounts have been sent out by the American Screw Company, Providence, R. I.; Russell & Erwin Mfg. Company, New Britain, Conn., and New York; Reynolds & Co., New Haven, Conn., and other manufacturers.

Sizes above 100 inches, $10 per box extra for every five inches.

An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

The price at which jobbers are to sell American Glass is to be decided by the American Glass Company, in conference with the jobbers. Such a conference will be held in the near future. Present sales are made at the prices to be decided upon. Complaints of jobbers cutting prices will be referred to the company for investigation and adjustment.

It is too early to say just what effect the new list will have upon the market, except that the net price will show an advance. It will be noticed that the new list is much higher than the one of May 1, 1895, and that there is a new arrangement of brackets. It is also higher, on the smaller sizes, than the French Glass list of September 20, 1897, which is now in use.

American Screw Company.—Under date January 1, American Screw Company, Providence, R. I., issue a discount sheet covering the varied lines of goods which they

Iron Machine Screws.

ROUND, FLAT AND FILLISTER HEADS.

Length. No.	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22	24	26	28	30
3/16	$0.25	$0.25	$0.25	$0.29	$0.29	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
¼	.25	.25	.25	.29	.29	$0.35	$0.35	$0.43	$0.43	....	....	....	....	....	....	....	....	....	.....
5/16	.27	.27	.27	.31	.31	.38	.38	.46	.46	....	....	....	....	....	....	....	....	....	.....
⅜	.27	.27	.27	.31	.31	.38	.38	.46	.46	$0.59	$0.74	$0 95	....	....	....	....	....	....	.....
7/16	.29	.29	.29	.33	.33	.41	.41	.49	.49	.59	.74	.95	....	....	....	....	....	....	.....
½	.29	.29	.29	.33	.33	.41	.41	.49	.49	.59	.74	.95	$1.10	$1.25	$1.45	$1.70	....	....	.....
9/16	.33	.33	.33	.36	.36	.46	.46	.54	.54	.66	.81	1.00	1.15	1.35	1.65	1.90	....	....	.....
⅝	....	.33	.33	.36	.36	.46	.46	.54	.54	.66	.81	1.00	1.15	1.35	1.65	1.90	....	...	.....
¾	....	....	.37	.42	.42	.52	.52	.63	.63	.74	.88	1.10	1.30	1.55	1.75	2.00	$2.45	....	.....
⅞	....	....	....	.48	.48	.60	.60	.72	.72	.85	1.00	1.20	1.40	1.65	1.90	2.20	2.70	$3.30	.....
1	....	....	....	....	.55	.70	.70	.85	,85	.97	1.15	1.35	1.55	1.80	2.10	2.55	3.10	3.75	$4.50
1⅛	....	....	....	...	....	.85	.85	1.05	1.05	1.25	1.45	1.65	1.85	2.10	2.50	3.00	3.60	4.35	5.25
1¼	....	....	....	....	....	.85	.85	1.05	1.05	1.25	1.45	1.65	1.85	2.10	2.50	3.00	3.60	4.35	5.25
1⅜	....	....	....	....	....	....	....	1.35	1.35	1.60	1.80	2.00	2.20	2.50	3.00	3.60	4.30	5.10	6.00
1½	....	....	....	....	....	....	....	....	1 35	1.60	1.80	2.00	2.20	2.50	3.00	3.60	4.30	5.10	6.00
1¾	....	....	....	....	....	....	....	...	....	1.80	2.05	2.40	2.55	2.90	3.45	4.10	4.85	5.70	6.65
2	....	....	....	....	....	....	....	....	....	....	2.30	2.75	2.90	3.35	3.95	4.65	5.45	6.35	7.35
2¼	....	....	....	....	....	....	....	....	....	....	....	3.10	3.25	3.70	4.35	5.00	5.85	6.90	8.00
2½	....	....	....	....	....	....	....	....	....	....	....	....	3.65	4.15	4.90	5.75	6.70	7.75	8.90
2¾	....	....	....	....	....	....	....	....	....	....	....	....	....	4.75	5.55	6.45	7.45	8.60	9.85
3	....	....	....	....	....	....	....	....	....	....	....		....	....	6.50	7.45	8.50	9.70	11.00
Threads	56	48	32, 36, 40		—30, 32—			24, 30, 32		—20, 24—		16, 18 20	—16, 18—			—14, 16—			

Brass Machine Screws.

ROUND, FLAT AND FILLISTER HEADS.

Length. No.	2	3	4	5	6	7	8	9	10	12	14	16	18	20	22	24	26	28	30
3/16	$0.32	$0.32	$0,32	$0.40	$0.40	....	....	....	....	....	....	....	....	....	....	....	....	....	.....
¼	.32	.32	.32	.40	.40	$0.58	$0.58	$0.86	$0.86	....	....	....	....	....	....	....	....	....	.....
5/16	.35	.35	.35	.43	.43	.62	.62	.86	.86	....	...	...	....	....	....	....	....	....	.....
⅜	.35	.35	.35	.43	.43	.62	.62	.86	.86	$1.00	$1.55	$2.00	....	....	....	....	....	....	.....
7/16	.39	.39	.39	.48	.48	.68	.68	.95	.95	1.15	1.70	2.10	....	.. .	....	....	....	....	.....
½	,39	.39	.39	.48	.48	.68	.68	.95	.95	1.15	1.70	2.10	$3 00	$3.60	$4.60	$6.00	....	....	.....
9/16	.48	.48	.48	.57	.57	.77	.77	1.05	1.05	1.30	1.90	2.35	3.25	3.90	4.90	6.30	....	....	s....
⅝	....	.48	.48	.57	.57	.77	.77	1.05	1.05	1.30	1.90	2.35	3.25	3.90	4.90	6.30	....	....	.....
¾	....	....	.60	.70	.70	.90	.90	1.15	1.15	1.50	2.10	2.60	3.50	4.30	5.40	6.70	$8.10	....	.....
⅞	....	....	....	.80	.80	1.05	1,05	1.35	1.35	1.80	2.30	2.90	3.75	4.70	5.95	7.40	9.00	$11.25	.....
1	....	....	....	....	.90	1.20	1.20	1.55	1.55	2.10	2.60	3.20	4.00	5.20	6.70	8.50	10.60	13.00	$15.75
1⅛	....	....	....	....	....	1.50	1,50	1.90	1.90	2.55	3.10	3.70	4.50	6.00	7.75	9.90	12.45	15.40	18.75
1¼	....	....	....	....	....	....	1.50	1.90	1.90	2.55	3.10	3.70	4.50	6.00	7.75	9.90	12.45	15.40	18.75
1⅜	....	....	....	....	....	....	....	2.50	2.50	3.00	3.60	4.30	5.00	6,80	8.90	11.55	14.70	18.35	22.50
1½	....	....	....	....	....	....	....	....	2.50	3.00	3.60	4.30	5.00	6.80	8.90	11.55	14.70	18.35	22.50
1¾	....	....	....	....	....	....	....	....	....	3.50	4.15	5.00	5.50	7.50	9.85	12.70	16.05	20.40	24.25
2	....	....	....	....	....	....	....	....	....	....	4.90	5.75	6.50	8.25	10.60	13.55	17.10	21.80	26.00
2¼	. ..	....	....	....	....	....	....	....	....	....	....	6.65	7.50	9,25	11.80	14.95	18.70	23.05	28.00
2½	....	....	....	....	....	....	....	....	....	....	....	....	9.00	10.50	12.50	15.50	19.80	25.35	30.50
2¾	....	....	....	....	....	....	....	....	....	.. .	..	....	....	12.00	14.00	17.00	21.80	27.50	33.00
3	....	....	....	....	....	....	....	....	....	....	....	....	....	...	16.00	19.00	24,10	29.70	36.00
Threads	56	48	32, 36, 40		—30, 42—			24, 30, 32		—20, 24—		16, 18 20	—16, 18—			—14, 16—			

Glass.—The following is the official list adopted January 1, 1898, by the American Glass Co.:

United Inches.	Sizes.		Single. 1st.	Single. 2d.	Single. 3d.	Single. 4th.	Double. 1st.	Double. 2d.	Double. 3d.
25	6x 8	to 10x15	$17.50	$16.25	$15.50	$15.00	$23.50	$22.00	$21.00
34	11x14 / 12x13	" 14x20	20.00	18.50	17.25	16.50	28.50	26.25	24.50
40	10x26	" 16x24	22.00	20.00	18.50	17.75	31.25	28.50	26.25
50	18x22 / 20x20	" 20x30	25.00	23.00	21.00	.....	34.50	31.75	28.75
54	15x36	" 24x30	27.00	24.50	22.00	.....	36.50	33.75	30.50
60	26x28	" 24x36	30.00	26.75	24.00	.....	41.00	37.25	33.75
70	26x34 / 28x32 / 30x30	" 30x40	33.50	30.50	27.00	.....	47.00	42.75	38.00
80	32x38 / 34x36	" 30x50	40.00	36.50	32.00	.....	55.00	50.50	45.50
84	30x52	" 30x54	41.25	37.50	33.75	.....	57.00	51.75	46.50
90	30x56	" 34x56	.....	.....	.....	.....	59.50	54.00	48.50
94	34x58	" 34x60	.....	.....	.....	.....	63.00	57.50	52.00
100	36x60	" 40x60	.....	.....	.....	.....	66.50	60.50	55.00

Lead Pipe, Sheet Lead, &c.—Under date January 3 the manufacturers of Sheet Lead, Lead Pipe, &c., announce the following prices, the reductions which are made being in sympathy with the tone of the Lead market:

	Per pound. Cents.
Lead Pipe	5½
Sheet Lead	6½
Tin Lined Lead Pipe	12½
Block Tin Pipe	30

White Lead.—A very fair business has been effected, mainly in the filling of old orders, but including some distinctly new business covering deliveries extending

over the next two or three months. Up to the date of this writing no change in prices has been announced by the leading corroders, and outside producers quite generally repeat their old quotations and terms.

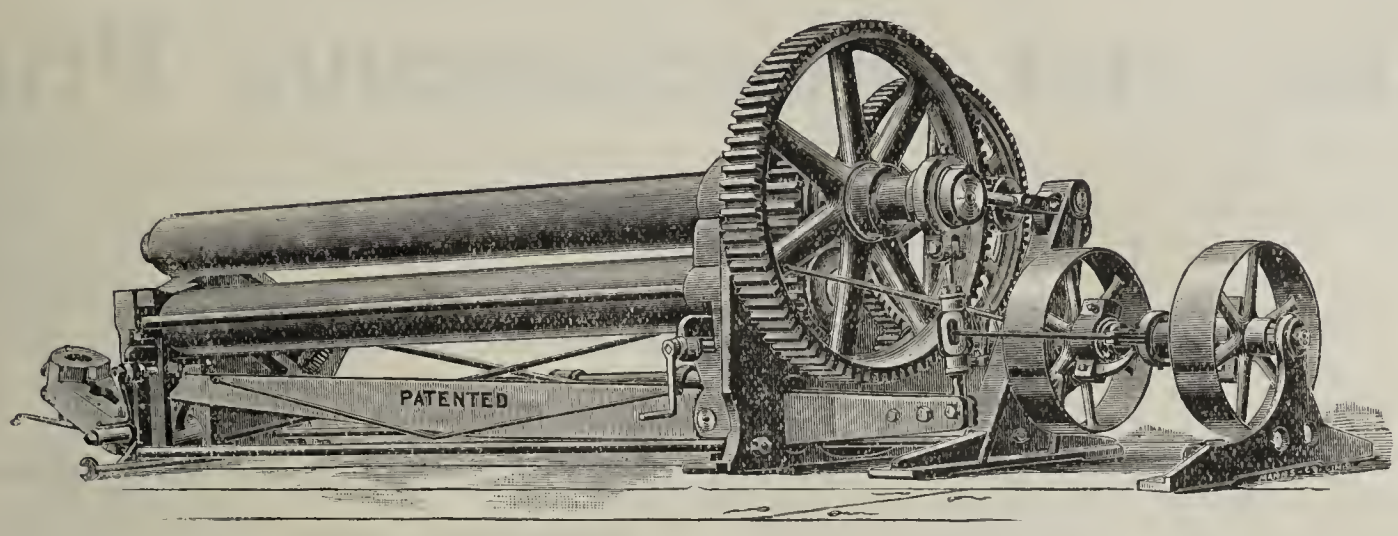
Red Lead.—Little or nothing more than ordinary business has been effected in Red Lead, and prices for all grades remain without important variation.

Linseed Oil.—The position remains very strong, there being scarcely any reaction from the highest prices of the season nor anywise severer competition between local and out of town crushers. Buyers are operating in merely ordinary way, however, and take very little above what may be required to cover well defined wants.

Spirits Turpentine.—A fairly good business has been effected and retail prices are firm at 35c. to 35½c. per gallon for moderate sized lots.

Improved Bending Rolls.

We present an engraving herewith of an automatic opening, closing and self adjusting roll, put on the market by Bertsch & Co., Cambridge City, Ind. The large rolls can be easily opened and closed, it is stated, by one man in five or ten seconds, by simply disengaging and turning back the hinged housing supporting the top roll. This raises and supports the end of the top roll, and at the same time lowers the opposite end of the bottom roll sufficiently to release a formed plate of extreme width. This is accomplished by the steel lever beneath being operated by a lug on the lower end of the hinged housing and connected to the opposite end of both the top and bottom rolls. By this arrangement the top roll need be raised but little to release a formed plate, and the bottom roll aids in raising and supporting the top roll. The hinged housing, lever and top roll being so constructed as to be in balance, the machine is opened and closed with great ease, and as the adjustment of the lower feed roll need not be changed in the least after the machine has been opened or closed it becomes practically a self opening and self adjusting roll. The manufacturers point out that these rolls being of the initial style, with large and strong gearing and having the two front rolls geared, which gives a positive feed, and the top roll being smaller than that of the old pyramid style, much smaller circles can be formed in one operation than with that style of roll. It is mentioned also that plates can be bent very near the end. The machine illustrated is for 10-foot lengths of ⅝-inch plate.



Improved Bending Rolls.

In December the Oliver Wire Company of Pittsburgh galvanized 3901 net tons of Wire. This is claimed to be the largest amount of Wire ever galvanized in a similar time at any single galvanizing plant in the country. To the Oliver Wire Company belongs the distinction of having the largest single galvanizing plant in the United States, if not in the world.

According to a cable dispatch from London the Rothschilds of Paris and Vienna, in conjunction with the Russian oil refiners of Baku, are forming a company who propose to supply Great Britain with high flash Russian oil of 103 degrees, in competition with the Standard Oil Company.

Laird Brothers, the Clyde shipbuilders, recently launched from their yards the torpedo boat destroyer "Express" for the British Government, the largest and fastest destroyer afloat. Her length is 235 feet, and her speed is to be 33 knots an hour, equal to nearly 38 miles.

A contract has been awarded by the Government of Ecuador to American capitalists for the building of a railroad between Guayaquil and Quito, at a cost of $17,532,000. The road will be about 404 miles in length and will attain hights greater than that approached by any other railroad in the world. The starting point, Quito, is 9350 feet above sea level and the railway in its course will cross the Chimborazo range at an altitude of 12,300 feet.

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Metal and Miscellaneous Prices.

CHICAGO, JANUARY 6, 1898.

Tin—

Straits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
IX, 14 x 56	21.00	$12.50
IXX, 14 x 56	24.00	14.00
IX, 14 x 60	23.00	13.50
IXX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	6 75
	IXX, 14 x 20	8.25
	IXXX, 14 x 20	9.75
	IXXXX, 14 x 20	11.25
	DC, 12⅛ x 17	5.00
	DX 12⅛ x 17	6.50
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$3.75
	IC, 10 x 20	5.50
	IC, 17 x 17	7.75
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.00
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.50
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	10.50@ 12.00
Worcester Grade, 12 to 14 lbs. coating	8.00@ 9.00
STP / L Grade, 10 to 12 lbs. coating	7.50@ 8.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.80¢	2.50¢
17 to 20	1.90¢	2.60¢
21 to 24	2.00¢	2.70¢
25 and 26	2.10¢	2.80¢
27	2.20¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ₩ lb, A....$10.20 } 10%
Patent Planished, ₩ lb, B..... 9.20 } dls.
Craig's Polished Sheet Steel.....8½¢
U.S. Polished Sheet Steel No. 27 A 5.45¢

Galvanized.

First quality.....dls. 80%

Copper—*Ingot.*

Lake.....11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper. Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots ..... ₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
No. 2 (guaranteed over 90% pure).
Small lots.....₩ lb, 34¢
100-lb lots.....₩ lb, 33¢
Nickel Aluminum Casting Metal.
Small lots.....₩ lb, 39¢
100-lb lots.....₩ lb, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....₩ lb, 35¢
100-lb lots .....₩ lb 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....₩ lb, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter .....₩ lb, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 lb or more. Less quantities, 5¢ ₩ lb additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	₩ lb	₩ lb	₩ lb
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks..... 5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead .....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne .....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. ₩ square,	$4.75	$4.50
Galv. ₩ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—

$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....₩ lb 2 ¢
" " Brown.....₩ lb 1½¢
" " Purple .....₩ lb 2½¢
" " Ground in oil, B. Red, ₩ lb 6½¢
" " Ground in oil, Red...₩ lb 6½¢
" " Ground in oil, Brown, ₩ lb 5½¢
" " Ground in oil, Purple, ₩ lb 6½¢
Linseed Oil, Boiled, in bbls.....40¢
Linseed Oil, Raw, in bbls.....38¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ₩ gal..... .34¢
Spirits Turpentine, in bbls., ₩ gal..35½¢
Asphaltum, Trinidad Refined, ₩ ton.$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.25
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ₩ roll 108 sq. feet.....$1.25
Roofing Pitch, ₩ bbl of 300 lb.....$3.00

NEW YORK, JANUARY 7.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₩ lb, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.58	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 8¾¢
Hallett's.....₩ lb, 7½¢
Japanese.....₩ lb, 7¼¢

Brass—Planished.....net

Roll and Sheet.....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.	
¾-in. up to 2-in.	$0.35	35% off.
⅝-in. up to ¾-in.	.36	
½-in. up to ⅝-in.	.38	
⅜-in. up to ½-in.	.41	
5-16-in. up to ⅜-in.	.48	
¼-in. up to 5-16-in.	.65	
3-10-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3-in. and larger	Special	
2-in. to 3-in., to No. 19, inclusive.	.38	

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ lb 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₩ lb, 2 00....	2.30¢
Nos. 17 to 21.....	₩ lb, 2.10....	2.40¢
Nos. 22 to 24.....	₩ lb, 2.20....	2.50¢
Nos. 25 and 26.....	₩ lb, 2.30....	2.60¢
No. 27.....	₩ lb, 2.40....	2.70¢
No. 28.....	₩ lb, 2.50....	2.80¢
American B. B.....	₩ lb, 4¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished 7/8 lb, A, 9¾¢; R, 8¾¢ net
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

Nos. 10 to 16.....	₩ lb, 12¢	75&10& 5% off.
Nos. 17 to 21.....	₩ lb, 13¢	
Nos. 22 to 24.....	₩ lb, 14¢	
Nos. 25 to 26.....	₩ lb, 15¢	
No. 27.....	₩ lb, 16¢	
No. 28.....	₩ lb, 17¢	
No. 29.....	₩ lb, 19¢	
No. 30.....	₩ lb, 21¢	

36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛@4¼¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb.....5¾@6¢
Lead, Amn. White, in oil.....5¾@6¢
Lead, Red, bbls. and ⅛ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American.....@1½¢
Red Venetian, American.....@1¾¢
Linseed Oil:
Raw, ₩ gal.....43@44¢
Boiled.....45@46¢
Spirits Turpentine:
In bbls.....35@35½¢
In cases.....43@43½¢
Putty:
In barrels and ⅛ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5 ¢
Clarified.....₩ lb 4¾¢
Accra.....₩ lb 4¾¢
Half Jack.....₩ lb 4½¢
Cecilia.....₩ 100 lb $4.85
Choice Red.....₩ 100 lb 4.60
(*Spot Oil*, ⅛c. ₩ lb *higher.*)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline.....₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
Wrought " " American Unions.....40%
" " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves..65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....70%
Galvanized Iron Range Boilers above 52 gallon.....70%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....65%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized.....50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizoutal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.

Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₩ bbl. $1.47@$1.48
Rosin, E & F.....₩ bbl. 1.52@ 1.60
Rosin, G. & H.....₩ bbl. 1.65@ 1.70
Rosin, I. & K.....₩ bbl. 1.80@ 1.90
Rosin, M. & N.....₩ bbl. 2.10@ 2.45

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars. Quarry Station.

Pennsylvania:

Best Bangor, ₩ sqr.....$3.75@$5.00
No. 1 Bangor Ribbon..... 3.35@ 3.75
Pen Argyle, ₩ sqr..... 3.75@ 4.35
Peach Bottom, ₩ sqr..... 4.75@ 5.60
No. 1 Chapman, ₩ sqr.... 3.80@ 4.80
Lehigh Slates, ₩ sqr .. .. 3.00@ 4.50

Vermont:

Sea Green, ₩ sqr.....$2.50@$3.55
Purple, ₩ sqr..... 3.25@ 4.00
Unfading Green, ₩ sqr... 3.75@ 4.50
Red, ₩ sqr..... 9.00@11.00

Solder and Soldering Fluids— Solder—

½&½ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb.....4¢
5% dis.

Yager's Soldering Salts.
½ lb bottles, each.....30¢
Large quantities, ₩ lb.....40¢

Soldering Coppers—

Per lb.....15½¢@17½¢ net

Spelter—

Western Spelter..... 4.40@4½¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15¼¢
Straits, pigs, lb lb.....14¾¢
Straits, in bars, ₩ lb.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Cailand or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20....	6.75
" "	IXXX,	14 x 20....	7.75
" "	IXXXX,	14 x 20....	8.75
" "	DC,	12½ x 17....	4.25
" "	DX,	12½ x 17....	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20...	5.75
" "	IXXX,	14 x 20...	6.50
" "	IXXXX,	14 x 20...	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:
100 lb.....10¢
95 lb.....15
90 lb.....20¢
85 lb.....25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating	8.00 @ 9.25
STP / L Grade, 10 to 12 lb coating	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Cal-land Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke, IC, 14 x 20..... $4.25
IX, 14 x 20..... 5.25

Terne Plates—

Worcester Grade, IC, 14 x 20.....	4.25
20 x 28.....	8.50
Dean Grade, IC, 14 x 20.....	4.00
20 x 28.....	8.00
Gilbertson's Old Method, IC, 14 x 20..	7.50
20 x 28..	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain..... 72%
1¼ and less, Galv..... 67%
1½ and larger, Plain..... 78%
1½ and larger, Galv..... 70%
Screw and Socket Joint Casing.....65%
Inserted Joint Casing.....60%
Boiler Tubes, 2¼ inch and smaller.72½%
" 2½ inch and larger 75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Wheeler, Russel & Son, Utica, N. Y.

Aluminum.
Reymond & Gottlob, 26 Cortlandt St., N. Y.

Aluminum Ware.
Illinois Pure Aluminum Co., Lemont, Ill.

Architectural Ornaments.
Art Metal Relief Co., Covington, Ky.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.
Dover Stamping Co., Boston, Mass.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Boilers, Range.
Wolff, L. Mfg. Co., Chicago, Ill.

Books.
Tower, F. W., Springfield, Mass.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Draiuers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Cocks, Ball, Basin and Stop.
Landers, Frary & Clark, New Britain, Conn.
Peck, Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Art Metal Relief Co., Covington, Ky.
Berger Bros., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N.Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.

Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O.
Ohl. Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Crimping Machines.
Packham Crimper Co., Mechanicsburg, Ohio.

Cuspidors.
Rochester Stamping Works, Rochester, N.Y.

Cut Offs, Rain Water.
Cooney, Seiner & Co., Indianapolis, Ind.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Berger Bros., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Dinner Pails.
Kleckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bowers, L. M & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Machinery.
Universal Machine Co., Canton, Ohio.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Elbow Patterns.
Rooney, Thos., Lockport, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Giblin & Co., Utica, N.Y.
Graff & Co., 208 Water St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Pease, J. F., F'ce Co., Syracuse, N. Y.
Peck, Williamson Heating & Ventilating Co., Cincinnati, O.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N.Y.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Hull, M. L., Cleveland, O.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Kent, C. M. Mfg. Co., Baltimore, Md.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Gutter Formers.
Whelan, Dennis, J., Troy, N. Y.

Hammocks.
Palmer, I. E., Middletown, Ct.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N.Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill.
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Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
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Gorton & Lidgerwood Co., 96 Liberty St., New York.
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Colwell Lead Co., 63 Centre St., N. Y.

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Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

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Huse, Jos. & Son, Boston, Mass.
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Vedder Pattern Works, Troy, N. Y.

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Marlin & Co., Pittsburgh, Pa.

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Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

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Weir Stove Co., Taunton, Mass.

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West Mfg. Co., Buffalo, N. Y.

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Vogel, Wm. & Bros. Brooklyn, N. Y.

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McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
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Phillips Tin Plate Co., Inc., Phila., Pa.
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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

Three first-class STOVE PATTERN FITTERS wanted by Rathbone, Sard & Co., Albany, N. Y. Jan. 8

A first-class TINNER; wages must be low; only those with first-class reference need answer. 233 Twenty-fifth street, Newport News, Va. Jan. 8

A SALESMAN familiar with steel French ranges among the hotel and restaurant trade of New York City and vicinity; must have experience and an acquaintance with this class of trade. "French Range," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

One first-class TINNER; one who can repair bicycles preferred; steady employment for the right man, in village of 1200 inhabitants; no floaters need apply; references required. Box 65, Shortsville, N. Y. Jan. 8

SALESMAN for 1898; side line; pays 20 to 25 per cent. commission; state territory covered. "S. O. Co.," Viaduct Arcade, Cleveland, Ohio. Jan. 8

SALESMAN to sell a first-class line ranges and furnaces to building trade; must have the acquaintance of architects, and experience in building trade in New York City and vicinity; references. Address with partculars, "Ranges and Furnaces," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

An experienced TINNER who can do all kinds of inside and outside work; one who is not afraid to work when boss is not around; strictly honest, sober, and who has had experience in store to clerk when called upon; German preferred; good wages paid every Saturday; steady job; references required; none other need apply. "S. F. H.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 8

TRAVELING SALESMAN calling upon the stove trade will find an advantageous arrangement possible on commission basis, selling steel ranges, air tights and other sheet metal goods for us; state present lines carried. Detroit Galvanizing and Sheet Metal Works, Detroit, Mich. Jan. 8

DIPPERS and BURNERS in an enameling factory; state experience and wages expected. "O. S.C.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

An experienced SALESMAN who is thoroughly acquainted with the trade in New York City and vicinity. N. & G. Taylor Co., Philadelphia, Pa. Jan. 1

A man acquainted among architects and builders to solicit orders for roofing and cornice work. "A. & B.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

By a manufacturer to correspond with SALESMEN who are in a position to market an up to date line of boilers. "Market," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

To correspond with SALESMEN visiting the Western territory. "Territory," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

A WORKING FOREMAN in a furnace and ventilating shop in Brooklyn, N. Y.; must be a thorough mechanic; shop employs six bench hands; steady job; nine hours' work; wages $4; non-union shop. "A. Z.," office of *The Metal Worker*, 232-238 William street, New York City. Jan 1

By a tin plate and metal house SALESMAN acquainted with the trade in Middle and Western New York State, Western Pennsylvania and Northeastern Ohio; also one acquainted with the trade in the States on the Atlantic seaboard; none but those thoroughly acquainted need apply. "Metal," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

A first-class STOVE PATTERN MAKER. "A. B.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

SALESMAN traveling Northern Pennsylvania and New York to handle a line of conductor pipes, eaves troughs, &c., who is well acquainted with the hardware and stove trade. F. E. Smith, 35 Washington street, Buffalo, N. Y. Jan. 1

SITUATIONS WANTED.

By a TINSMITH, ROOFER and SHEET IRON WORKER. L. Kronovitz, 410 East Tenth street, New York City. Jan. 8

With some good firm as SALESMAN on the road or in the store, by a man with ten years' experience in the general hardware, stove, house furnishing goods, painters' supplies and plumbing business; can assist at books. G. D. Davis, Mount Kisco, N. Y. Jan. 8

Competent STENOGRAPHER will arrange for hour's dictation daily, at very reasonable terms per week; German written. "M. M.," 40 Wall street, Room 69a, New York City. Jan. 8

As BOOKKEEPER by a practical bookkeeper with five years' experience in the plumbing, hot water, steam heating, furnace and range business, operate Remington typewriter, attend to correspondence, &c; A1 references from last employer. "Bookkeeper," office of *The Metal Worker*, 232-238 William street, New York City Jan. 8

After February 6, by a young TINNER, who desires to learn more of bench work; good hand at outside work; some knowledge of steam fitting; sober and single: prefer northern Maryland or to go east of Altoona. Calvin Bernesderfer, Manheim, Pa. Jan. 8

As MANAGER by an experienced man who has been in the steam heating business for 20 years in Baltimore and Washington; at one time president of a company; best of references. "Hubbard," 21 Clay street, Baltimore, Md. Jan. 8

By a practical PLUMBER and GAS FITTER; ten years' experience; strictly temperate. "E. O. B.," 390 South Jefferson street, Orange, N. J. Jan. 8

A PLUMBER and GAS FITTER; some experience at steam and hot water fitting; wages $2 50 per day; eight years' experience as journeyman; city or country. O. D. Burt, Winchendon, Mass. Jan. 8

AS FOREMAN or SUPERINTENDENT; capable of taking charge of factory in whole or in part; familiar with all modern machinery and tools used in manufacture of stamped, pressed and japanned ware, and specialties in plate metal; good draftsman, correct estimator; accustomed to handle large numbers of help, skilled and unskilled. "Experience," No. 18, office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

Steady position by a young man who is sober and industrious; understands all branches of the plumbing, steam and hot water heating business; also do all kind of tinning. McEdward Payne, Great Barrington, Mass. Jan. 8

By a first-class CORNICE SKYLIGHT MAKER; all around hand; posted on tin and sheet iron work. "M.," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Jan. 8

As FOREMAN, SUPERINTENDENT or ESTIMATOR in cornice works; have had considerable experience at above; strictly sober and reliable. "G. J. K.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

By a good all around TINSMITH; can do inside and outside work; steady and sober; 17 years' experience. Adolf Klein, 247 East Seventy-seventh street, New York City. Jan. 8

A STOVE PATTERN MAKER, ARTISTIC CARVER and DESIGNER with 25 years' experience would like to engage with a stove foundry at altering and redressing the wood patterns for the market up to the present style; will give references and photos of his ability in getting up new work. "Expert," Troy Nickel Works, 458 River street, Troy, N. Y. Jan. 8

A practical cornice and skylight man solicits correspondence and acquaintance of manufacturers in that line who desire capable man as CUTTER FOREMAN, ESTIMATOR or SUPERINTENDENT; reference from former employers and architects as to ability; prefer personal acquaintance before engagement. "Personal," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. Jan. 8

Owners, architects and builders; I have experience in suburban work, and being a practical PLUMBER, equipped with the most improved tools, &c., would like to hear from some one desiring my services; by contract or day work; material arranged; small or large buildings; references Al. Address by letter "P. J.," 123 West Forty-sixth street, New York City. Jan. 8

Steady job by a young man who is an all around hand at tinning, plumbing, stove and heater work; 12 years' experience; 28 years of age; wages $2 per day; sober and steady; city or country. John T. Burke, Bloomfield, N. J. Jan. 8

By a first-class PLUMBER, city or country. P. Kelly, 149 Concord street, Brooklyn, N. Y. Jan. 8

A first-class furnace and stove SALESMAN, having long and intimate business relations among the furnace, stove and hardware trade of New York State, Pennsylvania and New Jersey and the New England States, also a thorough knowledge of the New York City and Brooklyn trade, will be open for an engagement on January 1, and is in a position to place salable goods with the right people; best references. "S. W.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

An experienced managing SALESMAN, with first-class connections and acquaintance among the hardware and stove trade in New York City, Brooklyn and vicinity, is in a position to represent manufacturers of all heating and cooking goods or hardware specialties to great advantage in the above territory; first-class references. "H. A.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

TINSMITH, good workman in all branches of the trade, such as roofing, spouting, range, furnace, tinware and pump work, would like to have steady work; have had 18 years' experience; 34 years old, single, sober and steady. Chas. Stites, Port Jefferson, N. Y. Jan. 8

As SALESMAN on the road, by a middle aged man who has had 20 years' experience in stove pattern construction; would like a permanent position for reasonable wages with a good stove firm; can speak English and German fluently; is steady, reliable and industrious; would fill time out in the pattern shop, if not engaged on the road. "A. G. Salesman," 426 Fourth avenue, Lansingburg, N. Y. Jan. 8

Have had 17 years' experience in hardware, stoves and collateral lines; thoroughly posted on values, good stock keeper and first-class salesman; will be open after April 1 for engagement on road or as manager of retail house where hard work, strict attention to business and satisfactory results command fair pay; A1 references furnished. Lock Box 186, Lansing, Mich. Jan. 8

TINNER of 12 years' experience would like to get a job at once; have also had 15 years' experience in hardware business; will go anywhere or would run a shop on shares. Box 155, Mineral Point, Wis. Jan. 8

By a first-class CUTTER and RAISER. "G. R.," 116 Railroad street, Logansport, Ind. Jan. 8

By a PLUMBER and GAS FITTER; understands tinsmithing; reference and license; city or country. A. Yach, 718 Second avenue, New York City. Jan. 8

As ENAMEL MAKER, by a practical enameler of 12 years' experience on all cast iron goods, steel and sheet iron. Joseph Dickinson, 433 Gough street, Highland Town, Baltimore, Md. Jan. 8

As SALESMAN or HELPER in a shop; four years' experience as salesman and three years' as helper; 24 years of age; single; strictly temperate; references. Orrin Merritt, Barton, N. Y. Jan. 8

By a young man; seven years' experience at tin and sheet iron work; good pattern cutter; wages wanted, $9 a week. Chas. Carter, Rear No. 7, 230 North Front street, Philadelphia, Pa. Jan. 1

An experienced heating SUPERINTENDENT wants position with some city house or to represent out of town manufacturer in New York City; competent to plan, estimate and construct heating contracts in hot air, combination, steam and hot water; also has traveled trade contingent to New York City. "Contracts," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

Man, fairly good CUTTER and ESTIMATOR and practical mechanic in all branches of the cornice trade, would like to engage with some large firm where he can improve himself in the art of cutting and estimating; reasonable compensation; honest and faithful workman; 16 years' experience; capable of handling any amount of men, inside and outside. "Estimating," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 1

Steady job by a first-class PLUMBER in New York or some nearby city or town; strictly competent and reliable man, who understands furnace work and tin roofing; first-class references as to sobriety and character; nine years' experience; call or address. Thos. Walsh, 669 Third avenue, New York City. Jan. 1

As retail SALESMAN, to make estimates, look after the erection and all details of the furnace trade; for the past five years with one of the largest houses in the business. "Retail," office of *The Metal Worher*, 232-238 William street, New York City. Jan. 1

By a TINSMITH of five years' experience; roofing, gutter, pump and general jobbing; have some knowledge of furnace work; well acquainted with hardware; sober and steady; reasonable wages: Illinois preferred. General Delivery, Canton, Ill. Jan. 1

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Special Notices.

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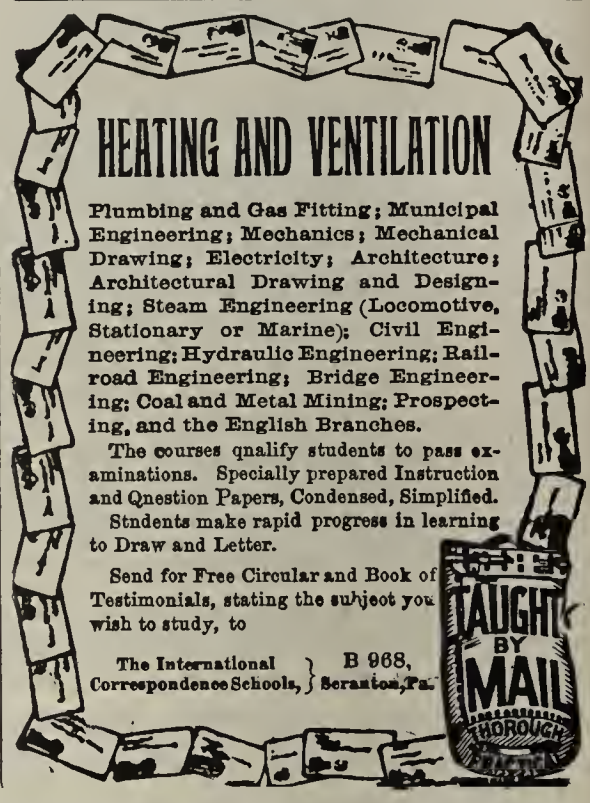
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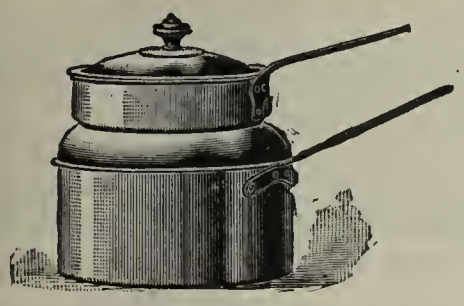
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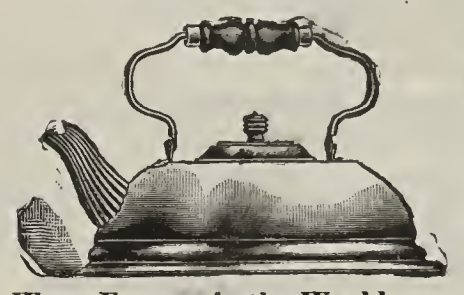
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—A BICYCLE company recently received the following letter from a Kansas man: "Deer sirz: "I live on mi farm near Hamilton, Kan., am 57 years old and just a little sporta. My neffew in Indiana bot hosself a new bisicle and sent me his old one by frate, and ive learned to ride sume. Its a pile of fun, but my bisicle jolts considerable. A feller came along yesterday with a bisicle that had hollow injun robber tires stuffed with wind. He leet me try hissen and mi, it run like a kushin! He told me you sell injun rober just the same as hissen. How much will it be to fix mine up like hissen? Mine is all iron wheels. Do you punch the hollow hole threw the injun robber, or will I have to do it myself? How do you stick the ends together after you get it done? If your injun robber is already holler will it come any cheaper empty? I can get all the wind I want out here in Kansas free.—Eberneezer Y. Jenson. P. S.—How much do you charge for the doodad you stuff the wind into the robber with and where do you start?"—*The Am. Field.*

—MISS NEW BOSTON—Mr. Simple, don't you find it difficult to decide whether the cell membranes of protoplasmic particles combine by cohesion or by chemical affinity?

Mr. Simple—No, ma'am. If anybody asks me troublesome questions I just say, "Well, in general I agree with Huxley and those fellows, don't you?" and that shut's 'em up, 'cause they never remember what Huxley does say.—*Judge.*

—HIS ADVICE.—Wife—Dear, the doctor says it is necessary for me to take a trip across the water. What do you think I would better do?

Husband—Get another doctor.—*Exchange.*

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THE AMERICAN HARDWARE STORE.

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It gives practical suggestions in regard to the arrangement of the store—office, shelving, counters, racks, bins, sampling, window display, etc., etc.

It describes the practice of Hardware merchants in all parts of the country, and many different methods of accommodating and displaying leading goods.

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To those who are intending to open new stores;

To those who want information as to the best methods of displaying and accommodating any given class of goods;

To those who wish to know how other merchants arrange their stores;

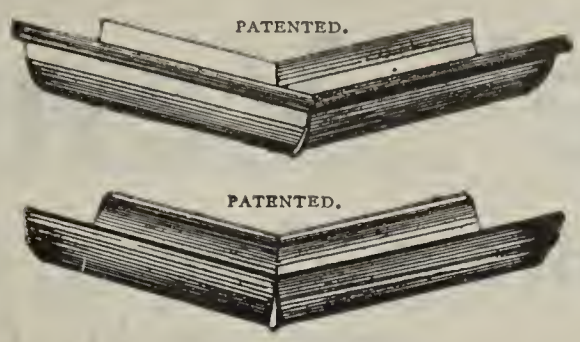
To those who are interested in the question of window display;

To those who are extending their business in any direction;

To those who desire practical suggestions in regard to the arrangement and sale of the different Hardware articles.

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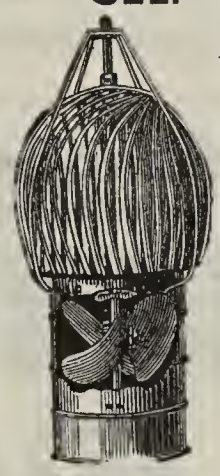
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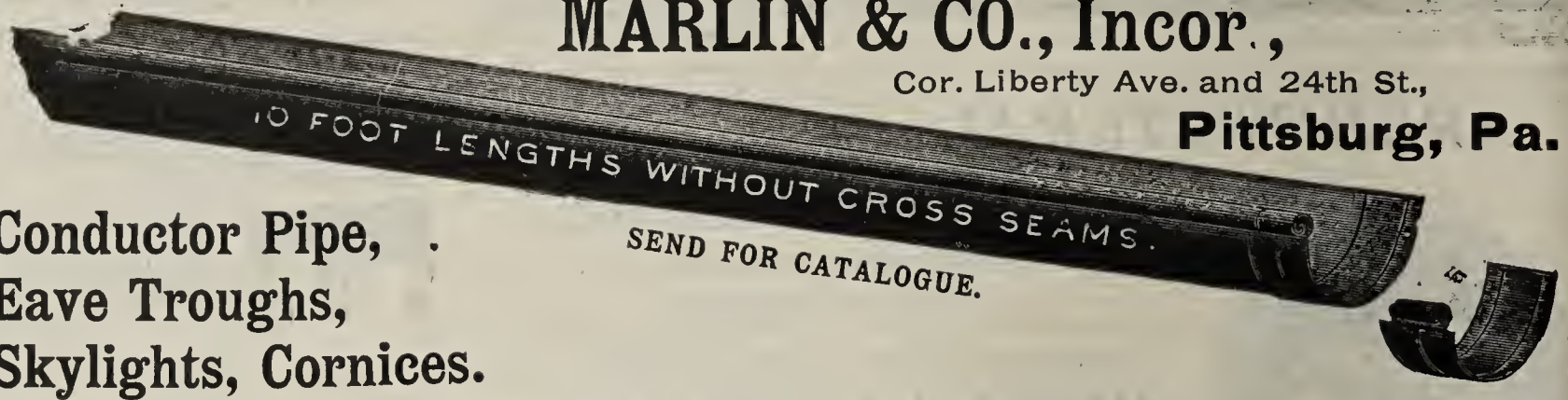
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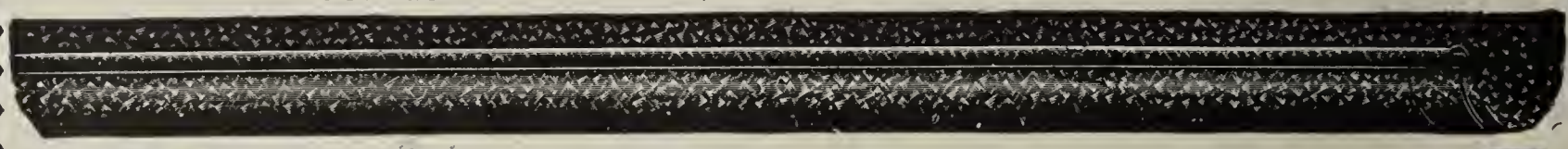
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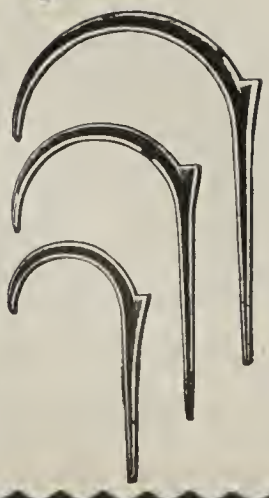




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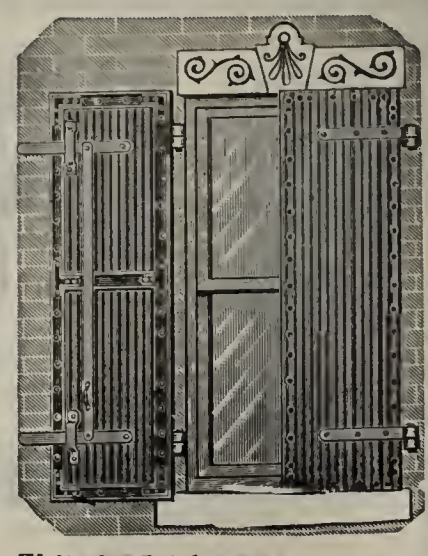
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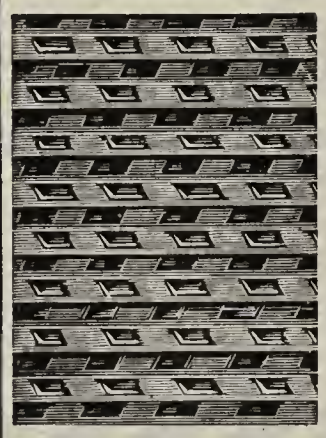
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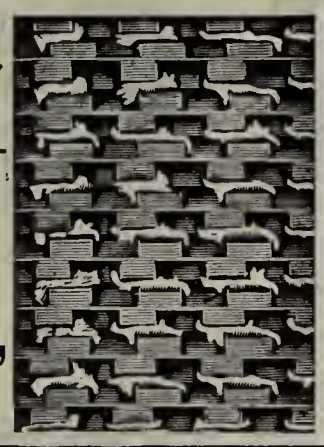
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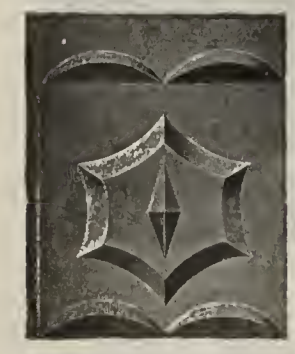
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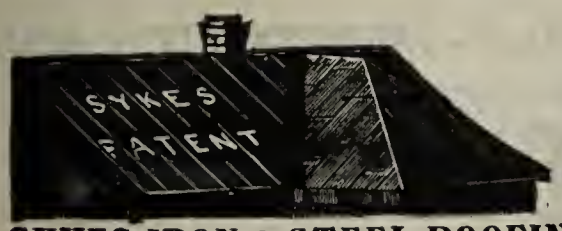
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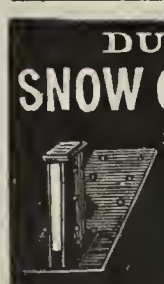


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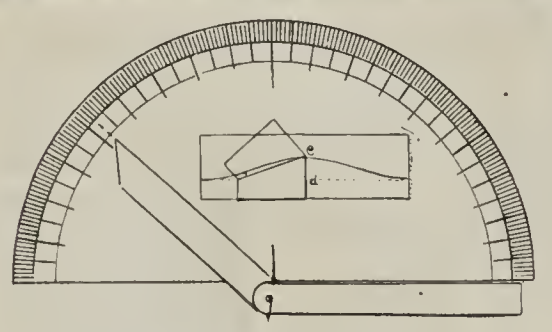


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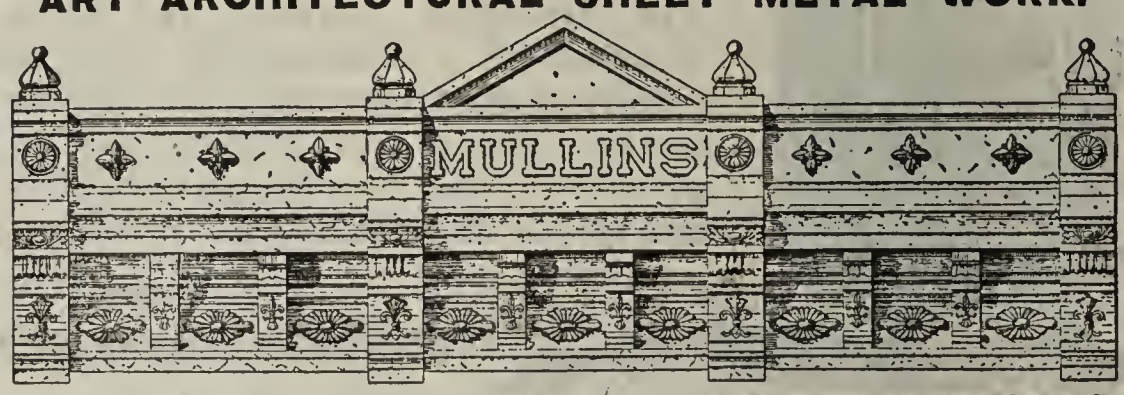
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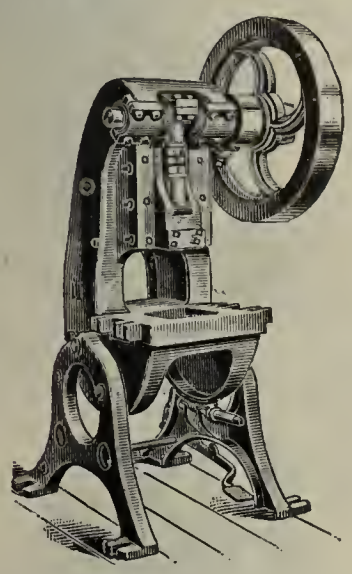
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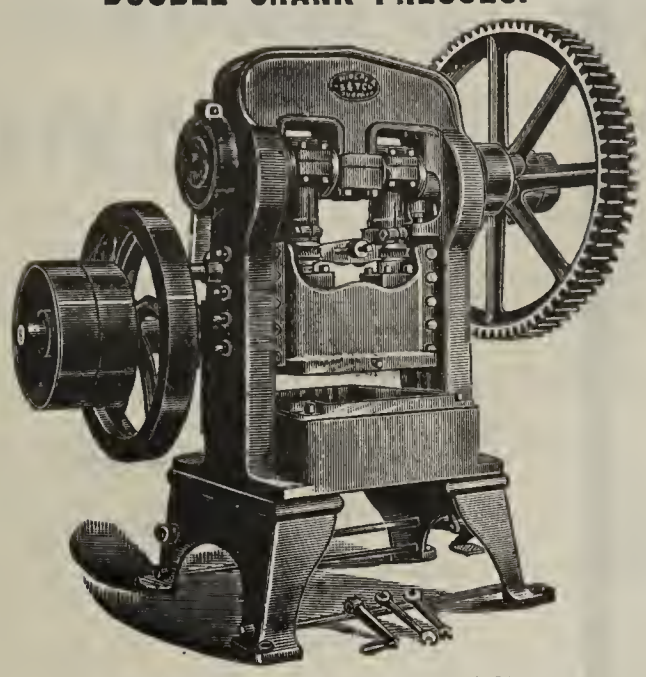
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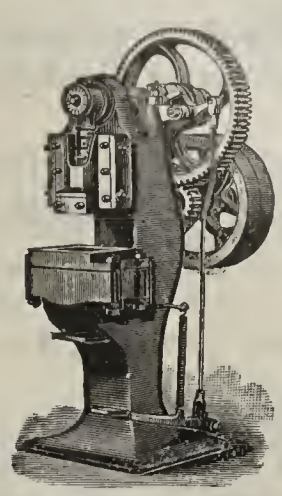


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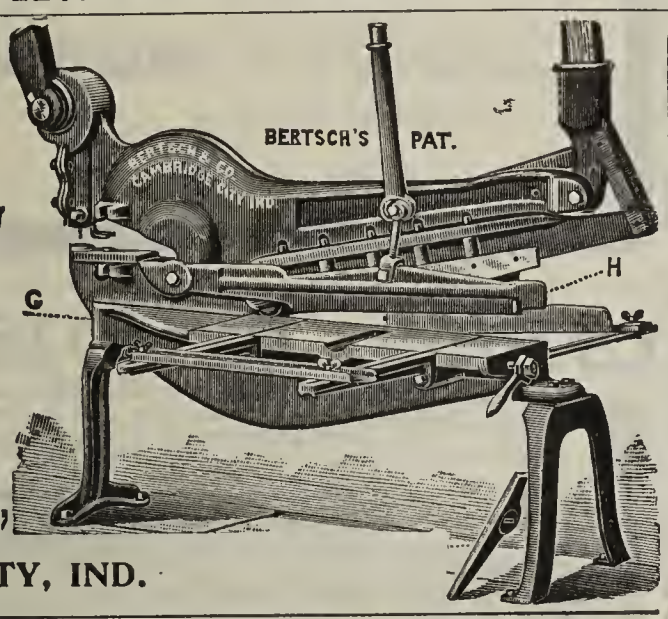
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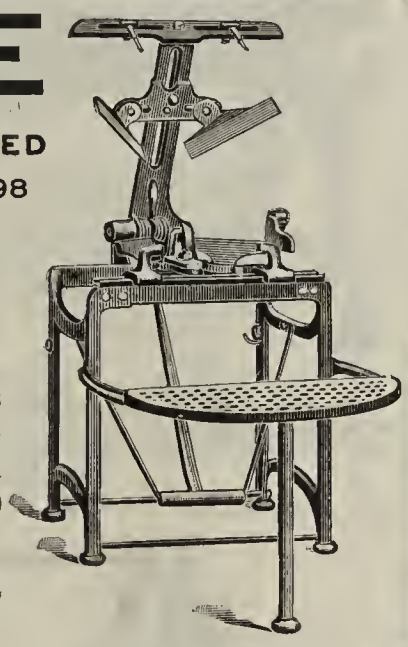
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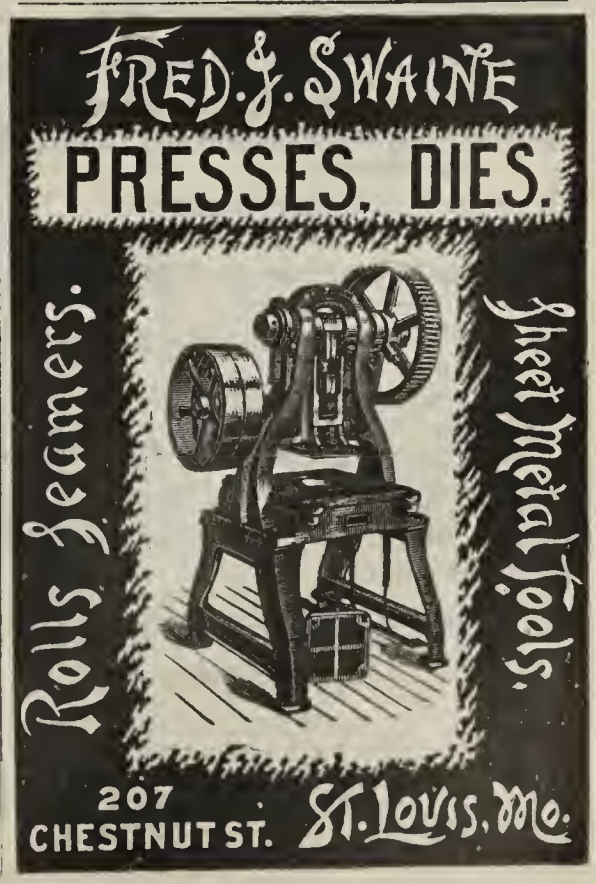
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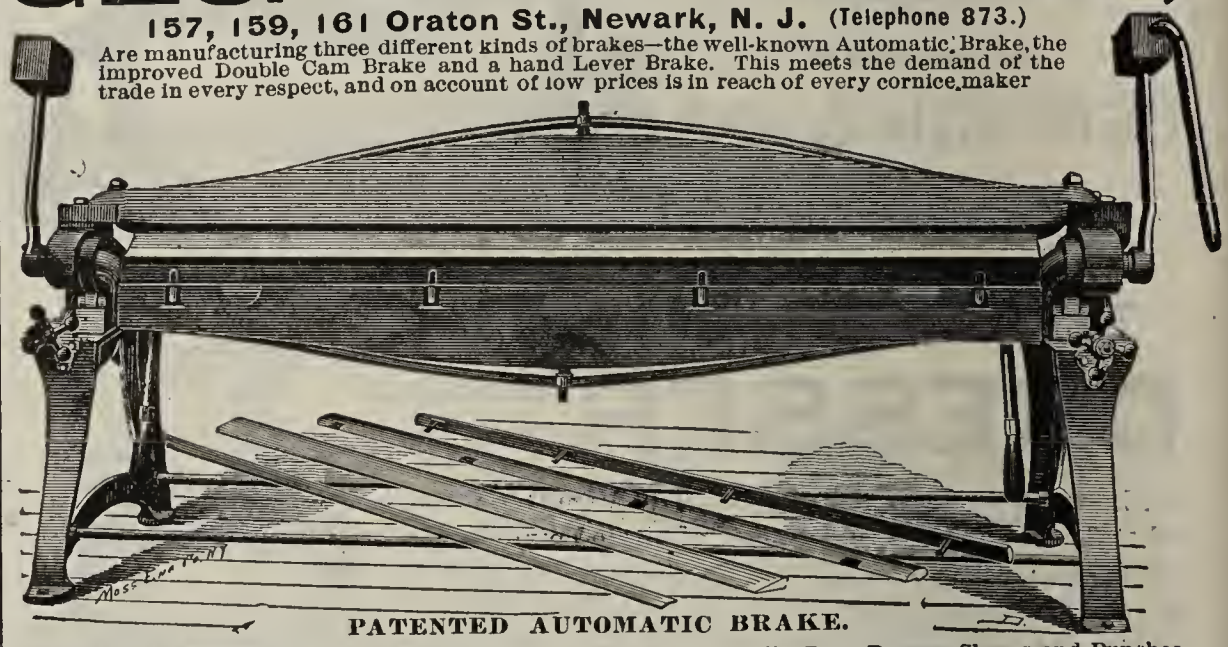
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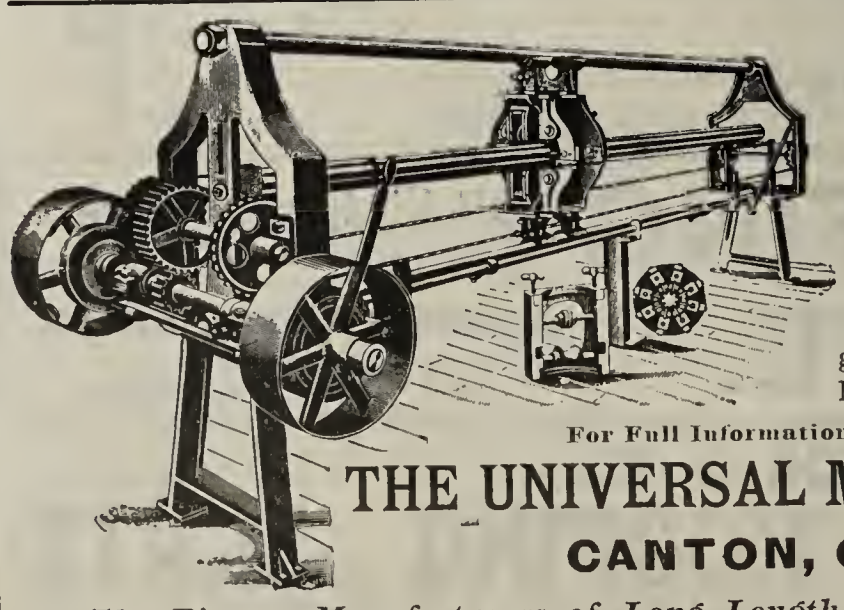
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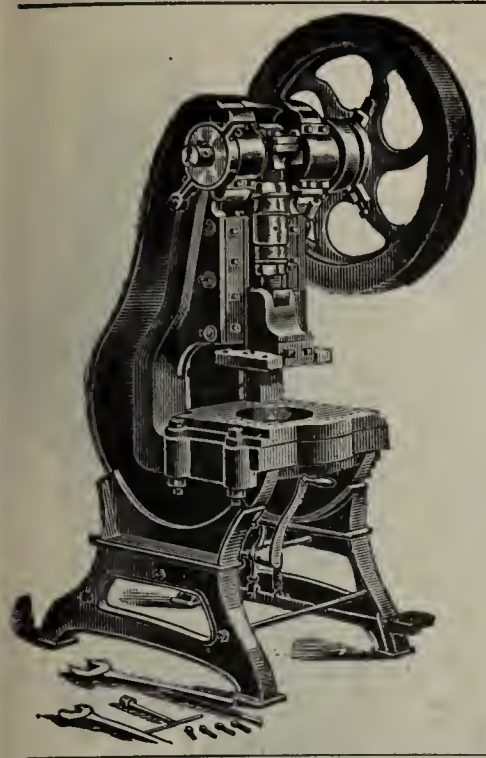
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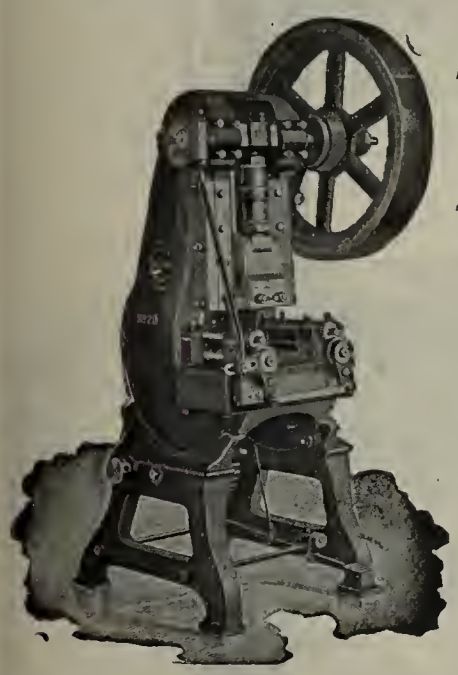
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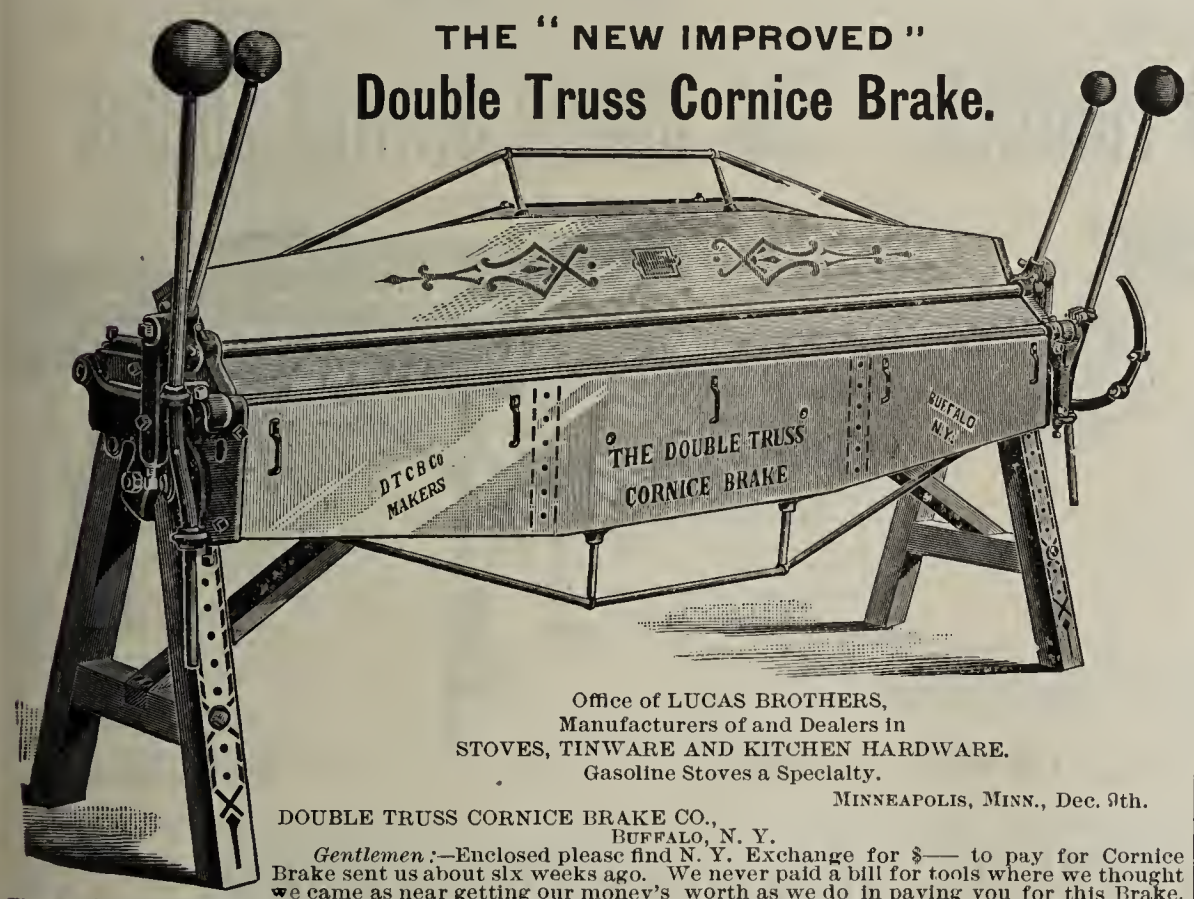
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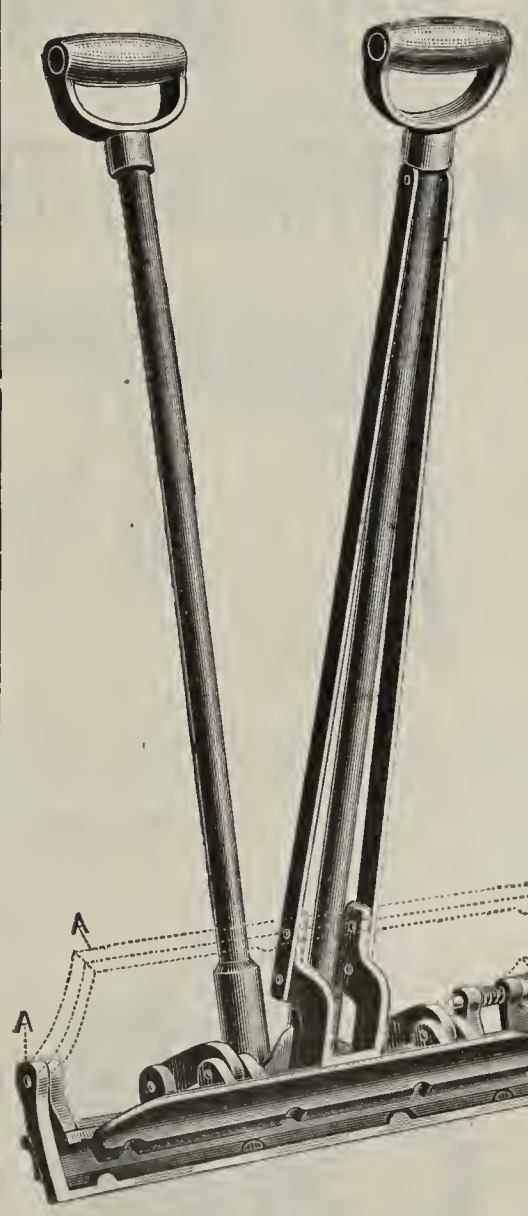
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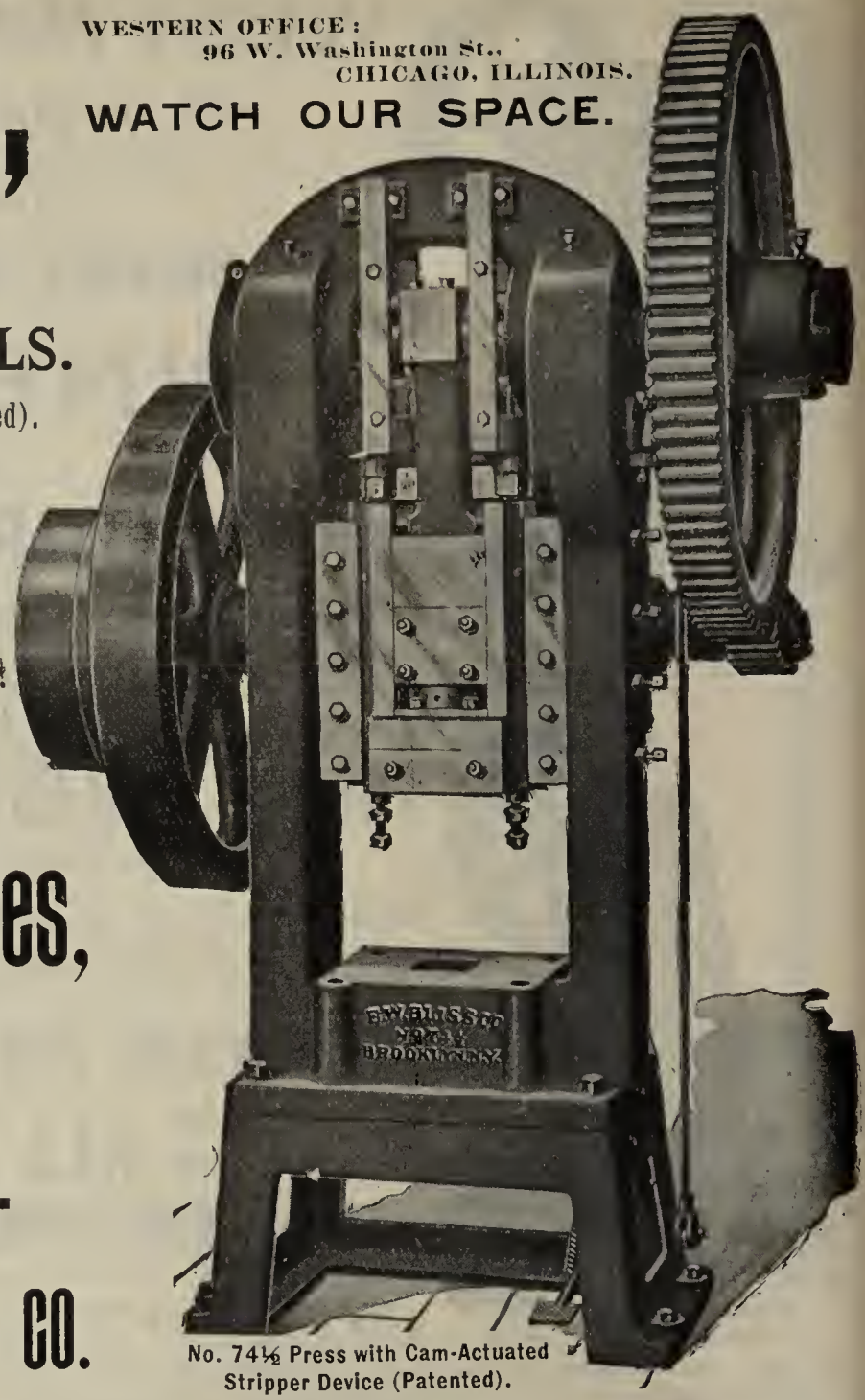
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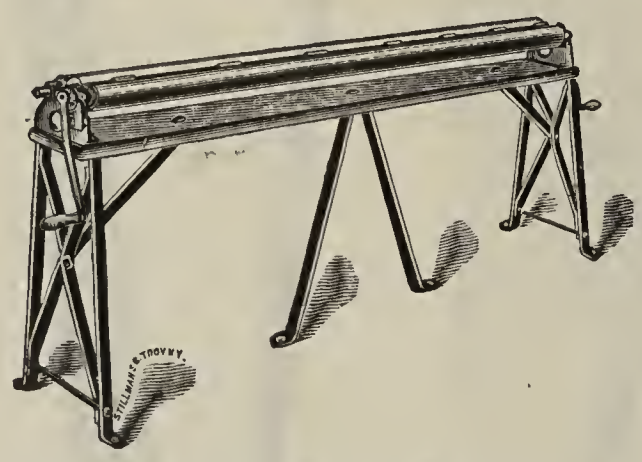
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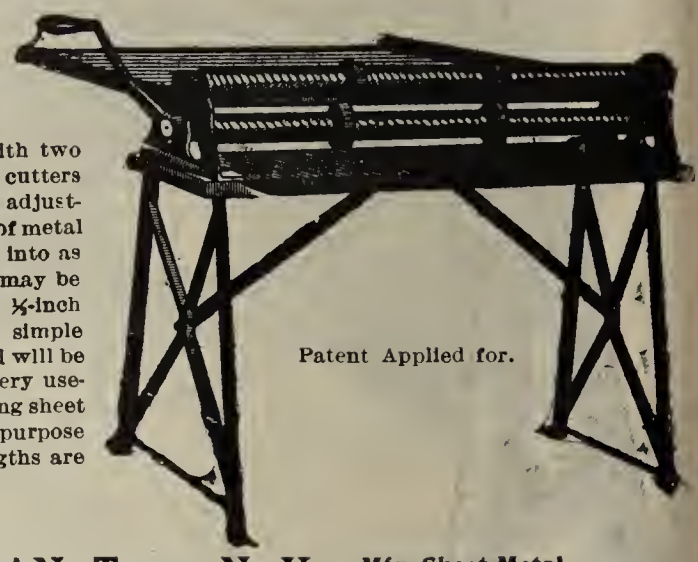
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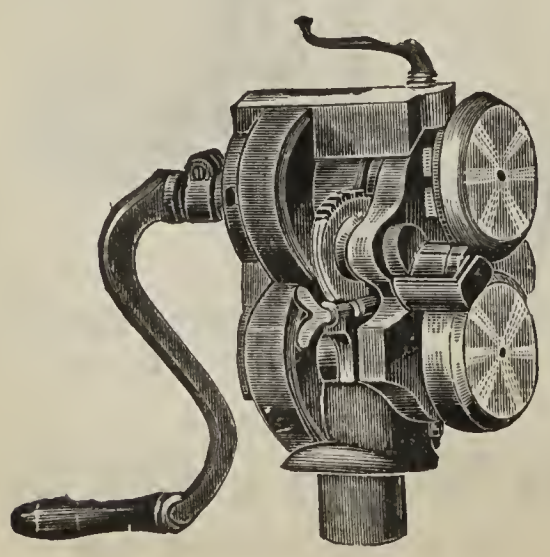


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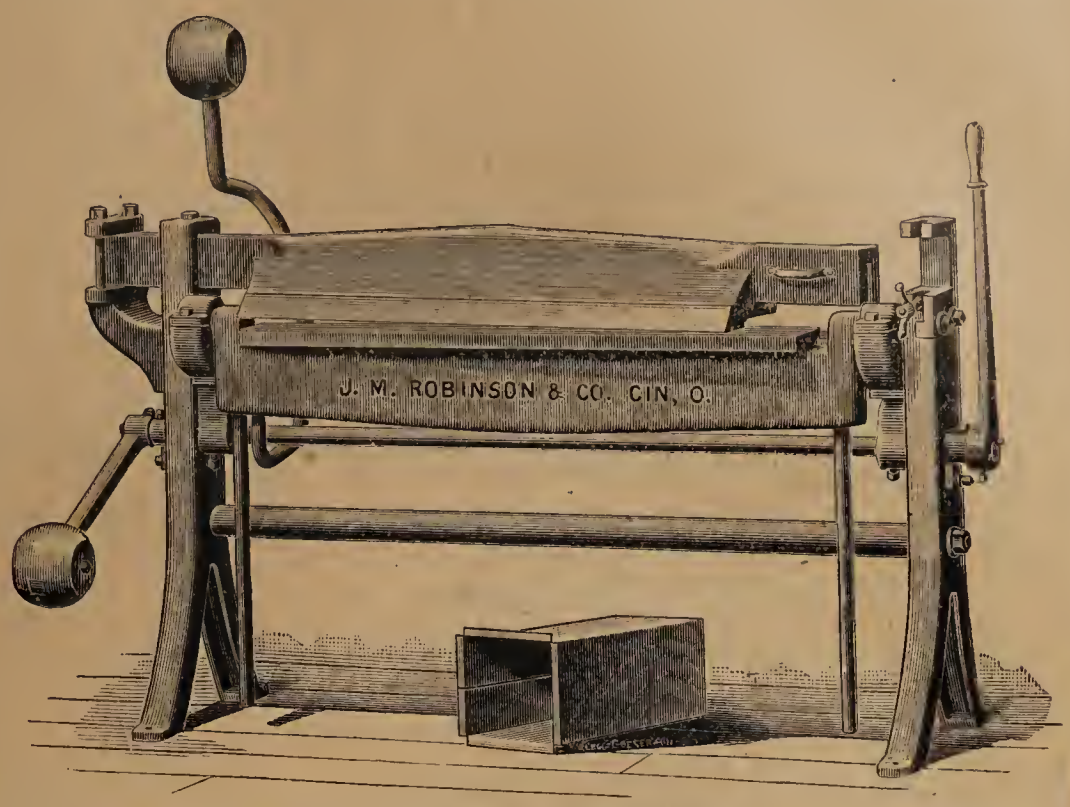
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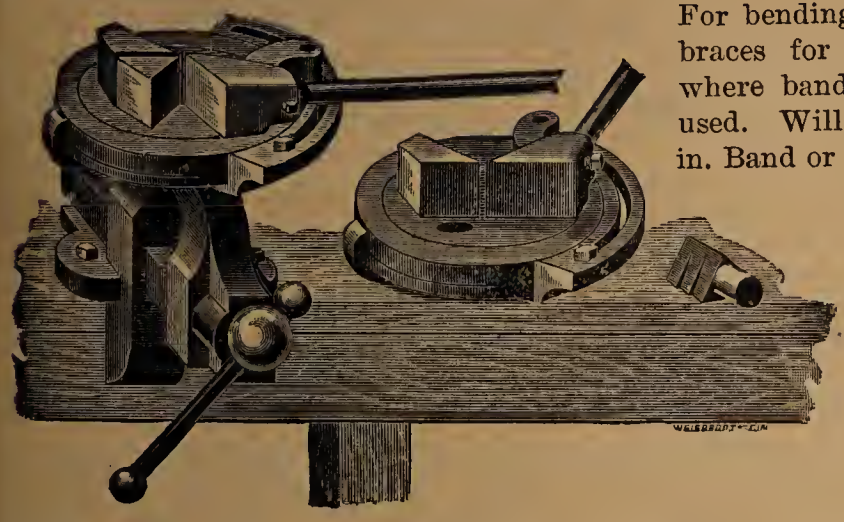
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"Now," said Lovejoy, "Abe's legs are altogether too long, and yours, Douglas, I think, are a little too short. Let's ask Abe what he thinks about it."

The conversation had been carried on with a view to Lincoln's overhearing it, and they closed it by saying:

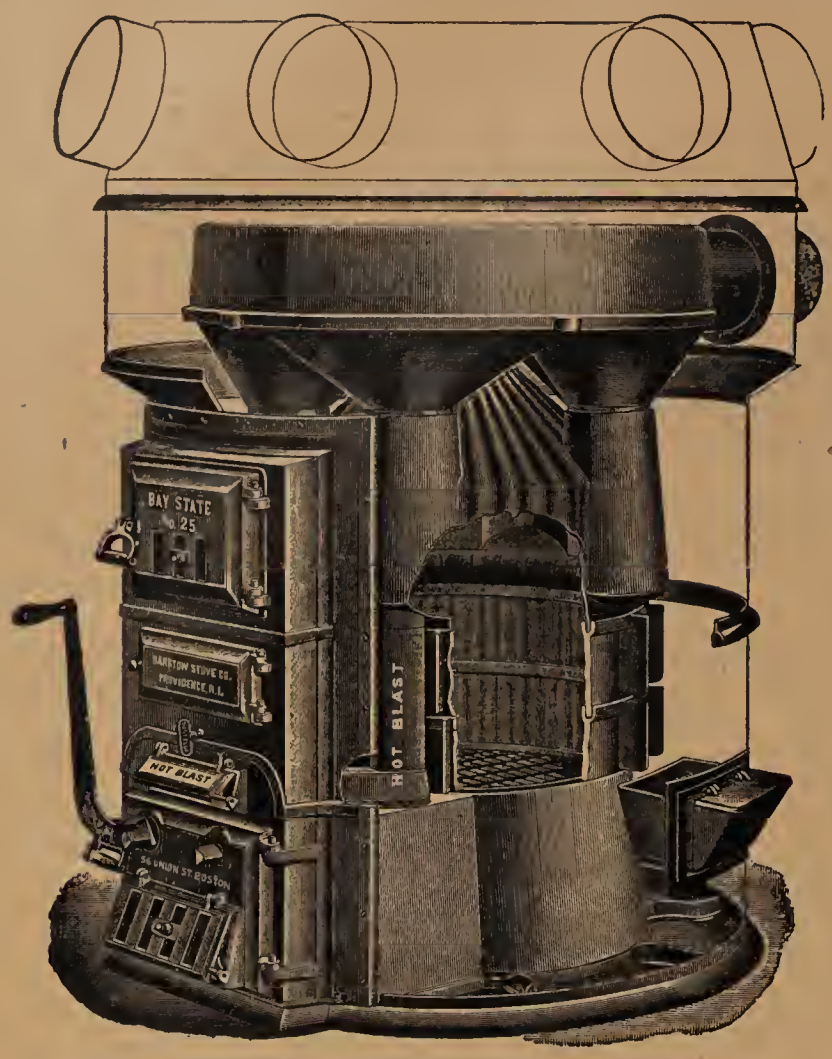
"Abe, what do you think about it?"

Mr. Lincoln had a far-away look as he sat with one leg twisted around the other, but he responded to the question, "Think of what?"

"Well, we're talking about the proper length of a man's leg. We think that yours are too long and Douglas' too short, and we'd like to know what you think is the proper length."

"Well," said Mr. Lincoln, "that's a matter that I've never given any thought to, so, of course, I may be mistaken, but my first impression is that a man's legs ought to be long enough to reach from his body to the ground."—*New West Trade.*

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6. ALL GENUINE stamped with Trade-Mark.

JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston.

THE MAGEE CATALOGUE

Shows a complete line of cooking and heating apparatus.

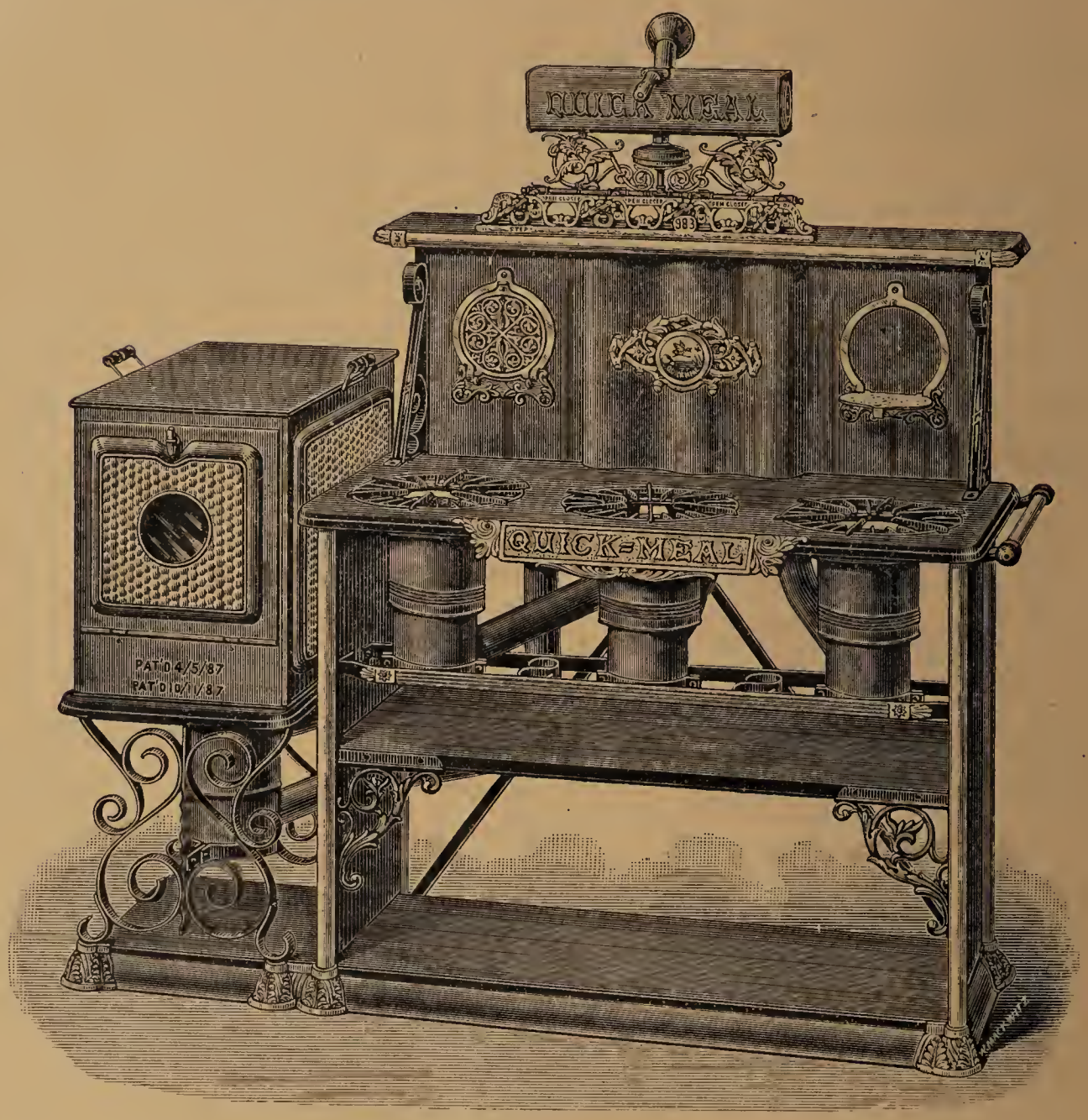
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MAGEE FURNACE CO., Boston, Mass

QUICK MEAL QUICK MEAL QUICK MEAL QUICK MEAL THAT'S WHAT THEY ARE. QUICK MEAL QUICK MEAL QUICK MEAL QUICK MEAL

QUICK MEAL

Gasoline Stoves



Considering our long years of experience in the manufacture of Gasoline Stoves and the perfection we have reached in the construction of all their small and intricate parts, it is not surprising that our books should contain over 3,000 Gasoline Stove Customers. The territory over which Quick Meal Gasoline Stoves are sold extends from Michigan to Texas—from Maine to California ; Canada, Mexico, South America, Australia and Germany are included therein.

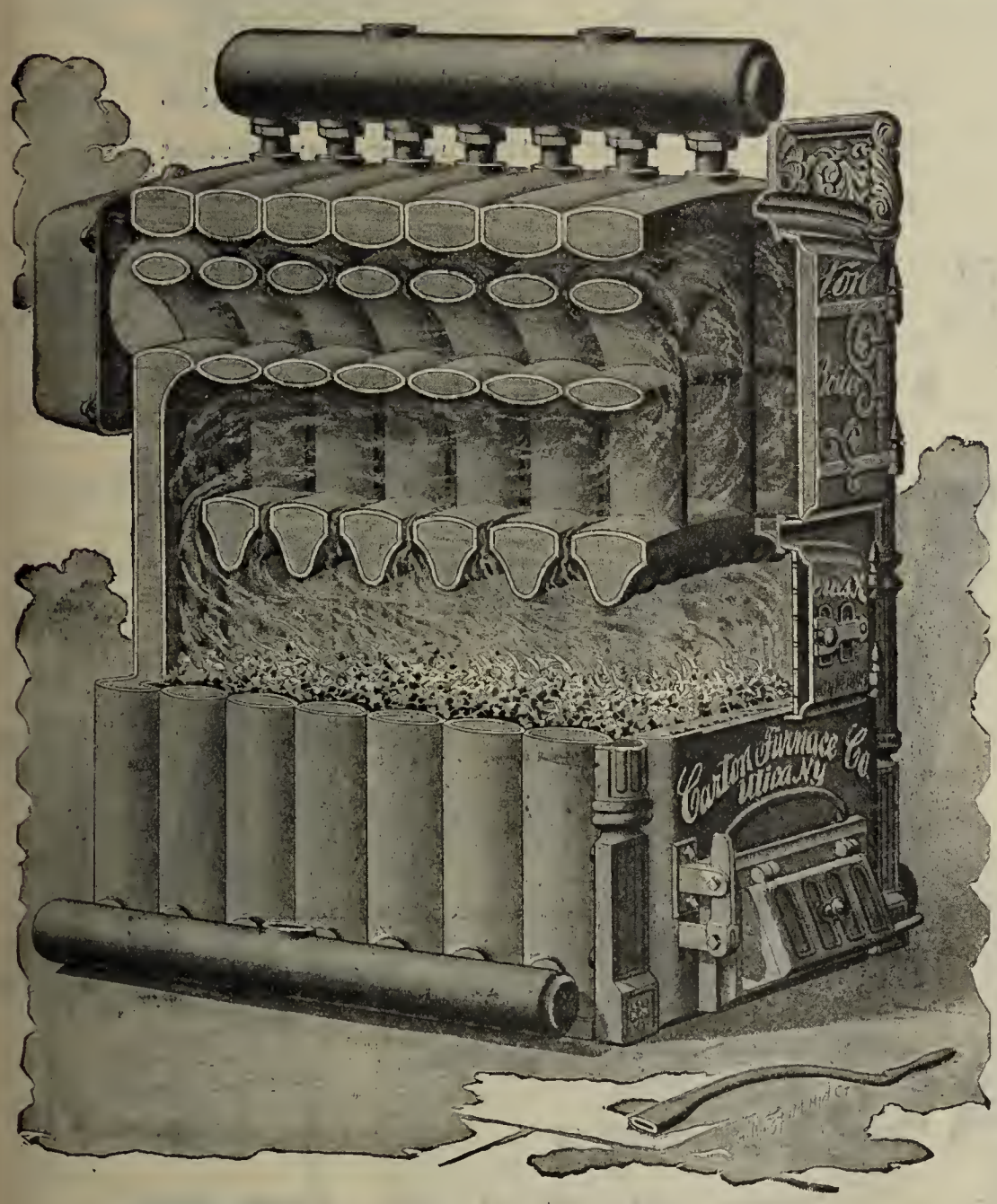
Quick Meal Steel Ranges Are Quick Sellers.

RINGEN STOVE Co. SAINT LOUIS

Carton

Hot Water & Steam Boilers & Furnaces.

HOT SHOT FROM A COLD TOWN.



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Clothier.

OGDENSBURG, N. Y.,
Jan. 1st, 1898.

CARTON FURNACE CO.,
Utica, N. Y.

GENTS:—Please find enclosed check for —— to balance account to date in full for my boiler.

The ***Boiler*** is all ***O. K.,*** and ***DON'T FORGET IT.***

Yours, resp'y,
JAMES MURPHY.

Write for our Golden Jubilee Boiler Catalogue.

IF INTERESTED IN HOT AIR FURNACES—WE MAKE A MOST COMPLETE LINE—SEND FOR FURNACE CATALOGUE.

CARTON FURNACE CO.,

Makers of Heating Apparatus for the past *51 Years,*

UTICA, N. Y.

Warm Air Furnaces (Thirteen Patterns).

Combinations (Six Patterns).

Steel Tubular Steam Heaters.

Hot Water Heaters (Three Patterns).

600 DEALERS SELL THESE HEATERS.

The Dealers' Favorite Line

ECONOMY Heaters & Furnaces

FOR Hard Coal, Soft Coal, Lignite, Coke or Wood.

Before selecting a line of apparatus to sell in 1898 ask for our prices and Catalogue—we can interest you.

J. F. PEASE FURNACE CO.,

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Why Don't You Buy

CYCLONE

FURNACES, RANGES,

STEAM OR WATER BOILERS?

The Best Goods in the World.

MANUFACTURED BY

RICHARDSON & MORGAN CO.,

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92 Beekman Street, New York.



RUSSEL WHEELER & SON
Wheeler
TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.

WHEN THE NEW YEAR COMES, LOOK OVER THE OLD YEAR'S BUSINESS.

If you haven't made money, look about you for a better line of goods.

TRY OURS.

If they don't make money for you, and satisfy you, by January 1st, 1899, then you will be the exception to the rule among our customers, and you had better look after your way of doing business, and not your goods.

THE FORBES WARM AIR FURNACE.

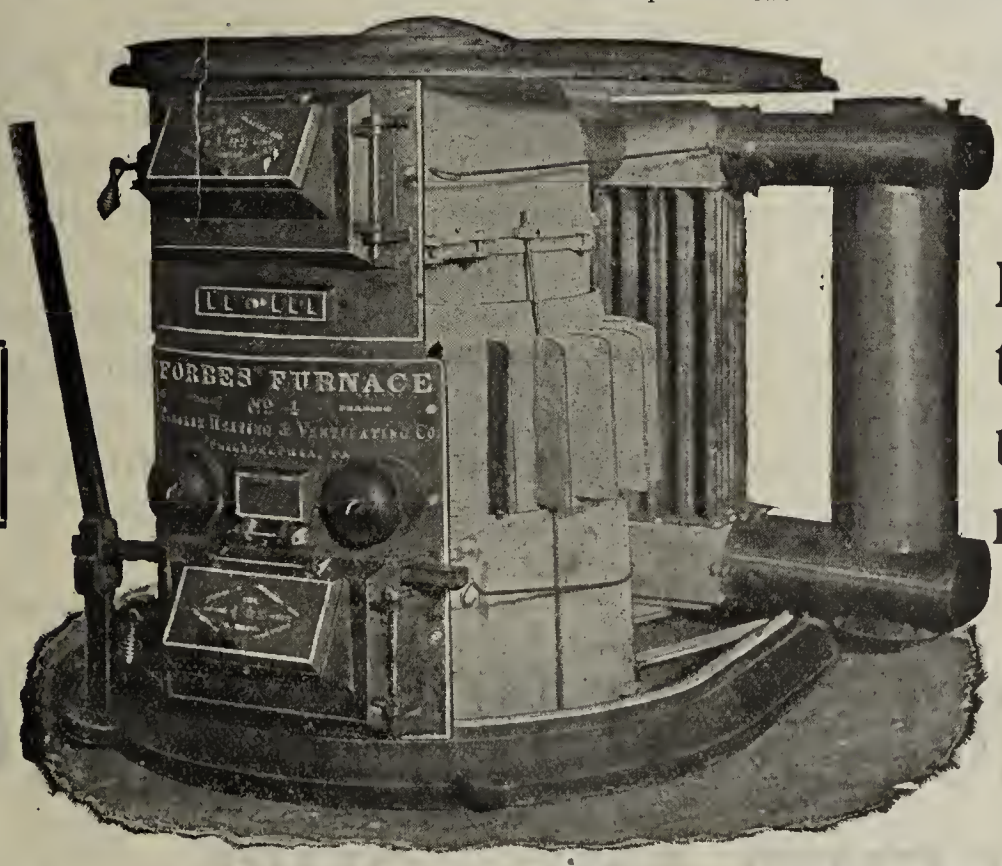
I. NEWTON EVANS,
REAL ESTATE,
HATBORO, PA.

TUESDAY AND FRIDAY,
221 SOUTH FIFTH STREET,
PHILADELPHIA.

HATBORO, PA., Dec. 26th, 1896.

MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.
MY DEAR SIR:

In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal. Very truly, I. N. EVANS.



SEND FOR CATALOGUE

COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

☞ Only 4 ft. 3 in. High in the Largest Sizes.

LOW PRICE.

TUBULAR HEATING AND VENTILATING CO.,

228 QUARRY STREET, PHILADELPHIA.

1898.

To accommodate the increased demand for our product, we have found it necessary to add to our already extensive works. This new addition, just completed, will add to our capacity fully one-third, giving us one of the largest and best equipped Factories in this line in the United States, and will enable us to fill orders promptly, and at the same time can guarantee that everything will be of the best. Our line of

Gasoline Vapor and Evaporating Stoves and Ranges

will include our improved, celebrated "Gem" Vapor Stove, which, as now made, must become the leading stove in the market. We also make the Process, Single and Individual Burner Vapor Stoves of all styles and descriptions ; and our line of High and Low Juniors, including the Lay-down, the Removable and Stationary Tanks, which will in the future, as in the past, be the most popular in the market. We also call special attention to our celebrated line of

Blue Flame Oil Wick and Wickless Cook Stoves,

which are now in use in more than fifty thousand families throughout the United States, who all bear willing testimony of their durability, economy, simplicity, and quick-lighting, and dealers will find less annoyance and trouble in handling our lines than any other make. We are also pleased to call attention to our popular line of

Gas Ranges, Stoves, Hot Plates, Etc.,

which for quality, style and price are recognized as the most popular in the market, and, as heretofore, we shall continue to manufature ***Specialties,*** including our Combination Tinners' and Plumbers' Furnaces, Paint Burner, Blow Pipe, and Laboratory Lamps ; Gasoline and Oil Electric Torches, celebrated for their durability and quick-lighting.

We do not hesitate to believe that it will be to the interest of all dealers to confine their sales to our line of Vapor and Evaporating Gasoline, Blue Flame Oil, and Gas Stoves and Ranges, etc.

Separate catalogues for each line will be ready for mailing on or before the 15th of January.

THE DANGLER STOVE & MFG. CO.,

CLEVELAND, OHIO.

DO NOT SPECULATE

IN

Cheap or Experimental

LINES OF

Vapor or Oil Cooking Stoves.



The average mortal has troubles enough of his own without buying those of his neighbor.

Speculation in any of the above mentioned lines will drain your purse and put you to a world of trouble.

Seeds of prudence now well sown in the selection of a line that is both complete and honest will yield a profitable and happy harvest. A good beginning for 1898 means half the battle won.

If you are interested in the handsomest line made, write for our catalogue.

EXCLUSIVE AGENCIES GIVEN.

THE SCHNEIDER & TRENKAMP CO.,

CHICAGO, ILLINOIS. CLEVELAND, OHIO.

THE MONARCH LINE

"New Method" MONARCH "New Method"

"Smokeless Giant Generator" MONARCH "Smokeless Giant Generator"

"Smokeless Safety Junior" MONARCH "Smokeless Safety Junior"

"Blue Flame Oil" MONARCH "Blue Flame Oil"

"Asbestos Filled Oven" MONARCH "Asbestos Filled Oven"

"Beautiful New Catalogue" MONARCH "Beautiful New Catalogue"

READY JANUARY 20th, 1898.

A COPY FOR THE ASKING.

THE MONARCH STOVE & MFG. CO.,

MANSFIELD, OHIO.

DISTRIBUTING DEPOTS:

NEW YORK. CHICAGO. PHILA. ST. PAUL. PITTSBURG.
DANVILLE, PA. LINCOLN, NEB. EVANSVILLE, IND.

THIS CUT



SPEAKS FOR ITSELF.

It also vouches for what we have Claimed and Proved for Many Years, viz.: That our WARM AIR FURNACES

Have Acknowledged Excellence.

Now is the time to secure the Agency.

KERNAN FURNACE CO.,

105 Beekman St., New York City. UTICA, N. Y.

PACIFIC RANGES Are Best

BECAUSE

They're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

It is made with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal; is the latest, best and handsomest Steel Range ever offered, one that you can offer as simply "out of sight" compared with that sold by the peddlers. Try it.

... THE ...

John Van Range Co.

Warerooms:—419 ELM ST.;

Factories:—6-8-10 and 12 HOME ST.,

CINCINNATI, O.



New York, Jan. 10th, 1898.

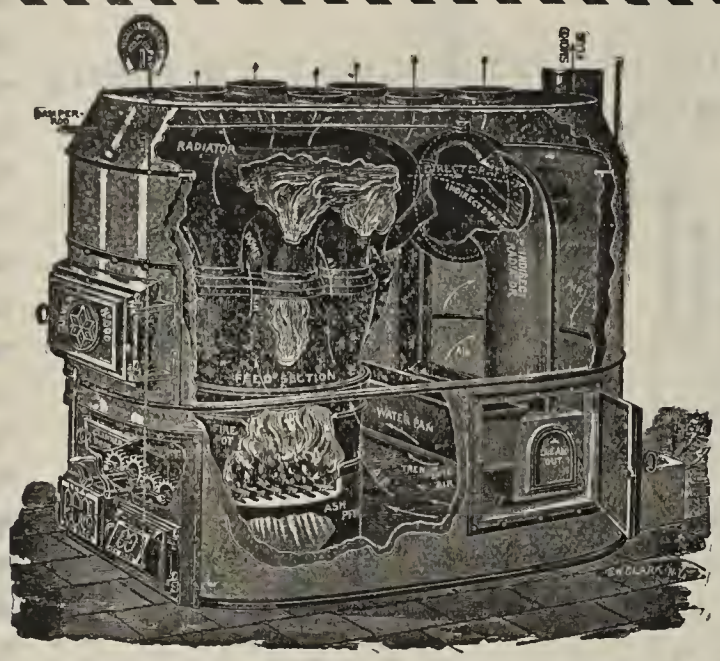
GENTLEMEN:

We wish you a ***happy and prosperous New Year.*** There are good times coming. May we ask you to get ready for the ***furnace business of 1898*** by an examination of our ***reliable*** and ***thoroughly established furnaces?***

It will repay you to do so!

Very truly yours,

GRAFF & CO., 208 Water Street.



THE SIMONDS FURNACE CO.,

SUCCESSORS TO THE SIMONDS MANUFACTURING CO.,

No. 50 CLIFF ST., NEW YORK,

Manufacturers of the Celebrated

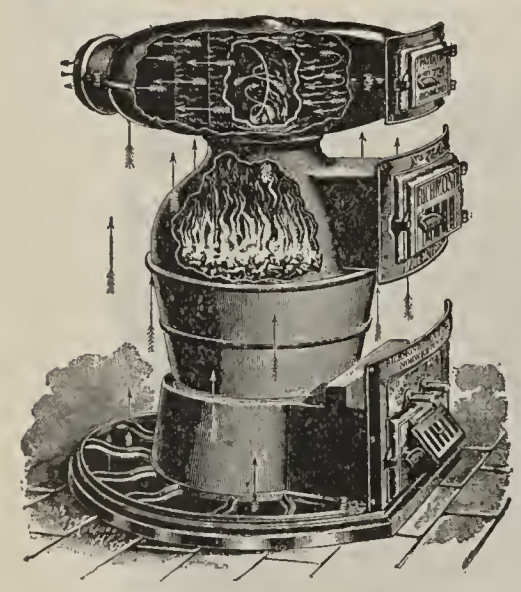
"CULVER AND MONTANA FURNACES."

Double and Single Oven Ranges, with special features and latest designs.

STEAM AND HOT WATER BOILERS.

Our new Elliptic Furnace has unequaled radiating surface and is sure to give satisfaction.

Send for Catalogues and Prices.



The Richmond Stove Company

make all kinds of

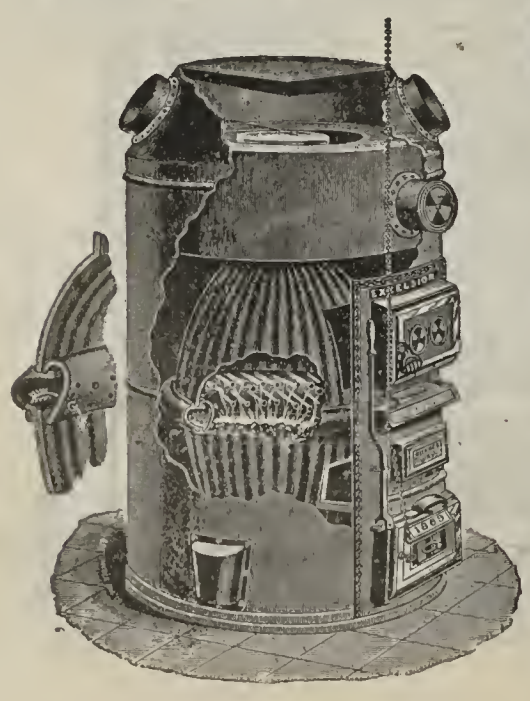
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is a guarantee of excellence and reliability.

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Works:
NORWICH, CONN.



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AND

FITTINGS.

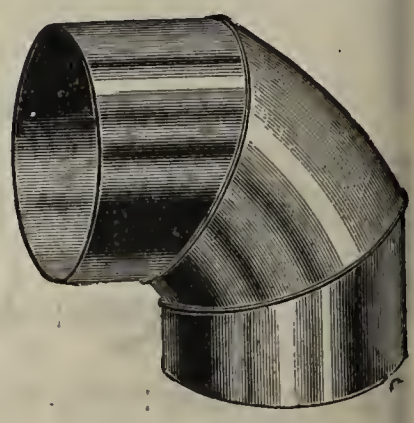
ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
AT ATTRACTIVE PRICES.

THE EXCELSIOR STEEL FURNACE CO.,

38 W. MONROE ST., CHICAGO.

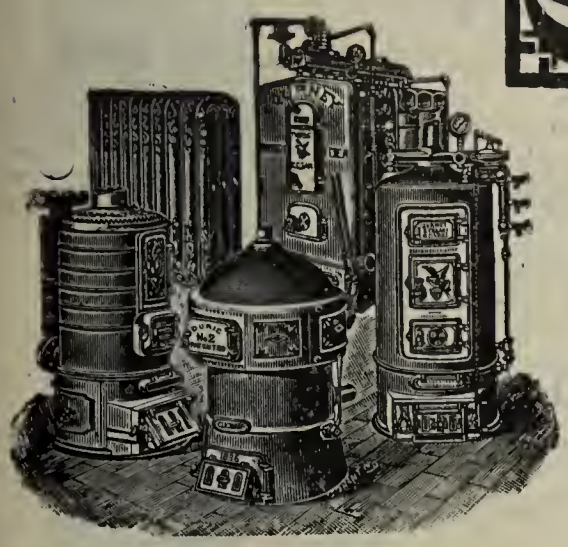
See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



of Furnace Pipes and Fittings.

1898 **Gurney** 1898

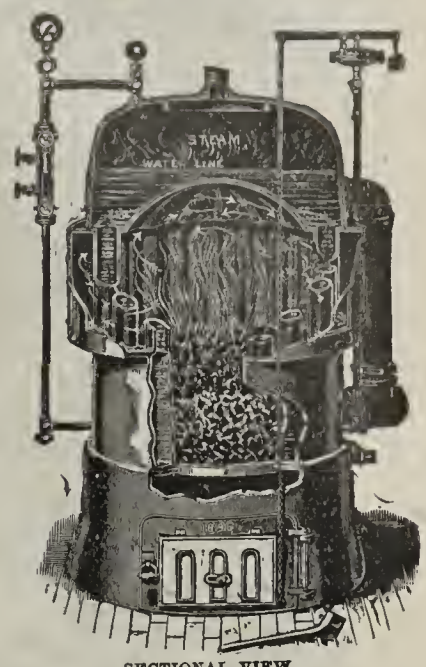


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THE STANDARD OF THE WORLD.
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SOLD ONLY THROUGH THE TRADE.

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163 Franklin St., Cor. Congress,
BOSTON, MASS.
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CAPACITIES TO MEET ANY
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SECTIONAL VIEW.
DORIC SEAMLESS TUBULAR STEAM BOILER.

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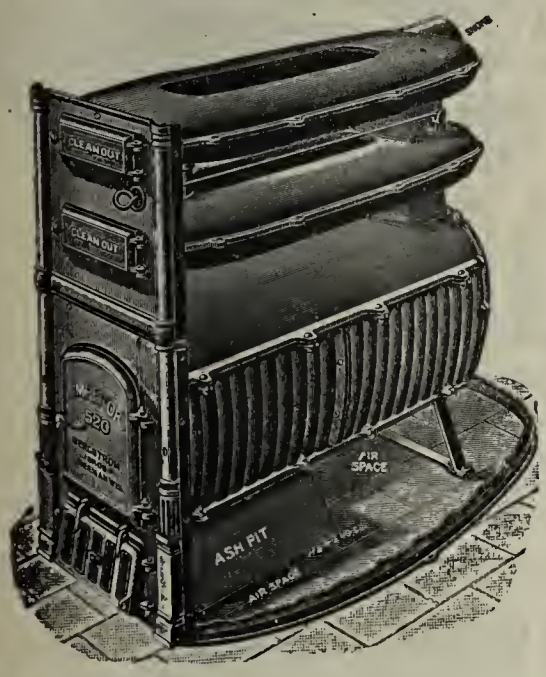
The **Plummer Heaters.**

THE PLUMMER BRICK SET **STEAM HEATER,** NEW MODEL.

THE **LEADER** HOT WATER HEATER.

Made in our own plant. Send for Catalogue.

THE PUTNAM FOUNDRY & MACHINE CO., - Putnam, Conn.



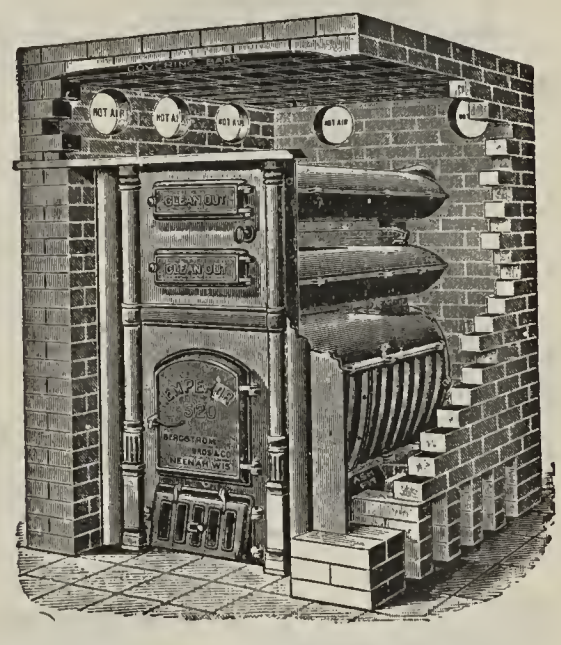
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FOR WOOD.

Simple, Safe, Durable.
ECONOMICAL IN FUEL.
The Best and Cheapest Line of Wood Furnaces.
Furnished for either Brick or Galvanized iron Casing.

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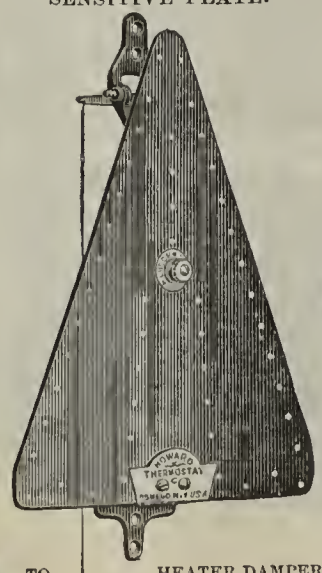
Bergstrom Bros Co.

NEENAH, WIS.



THE **HOWARD THERMOSTAT**

SENSITIVE PLATE.



The **O=K** Draft Regulator.

"A Regulator IN TIME SAVES COAL"

9-TIMES ITS COST-9

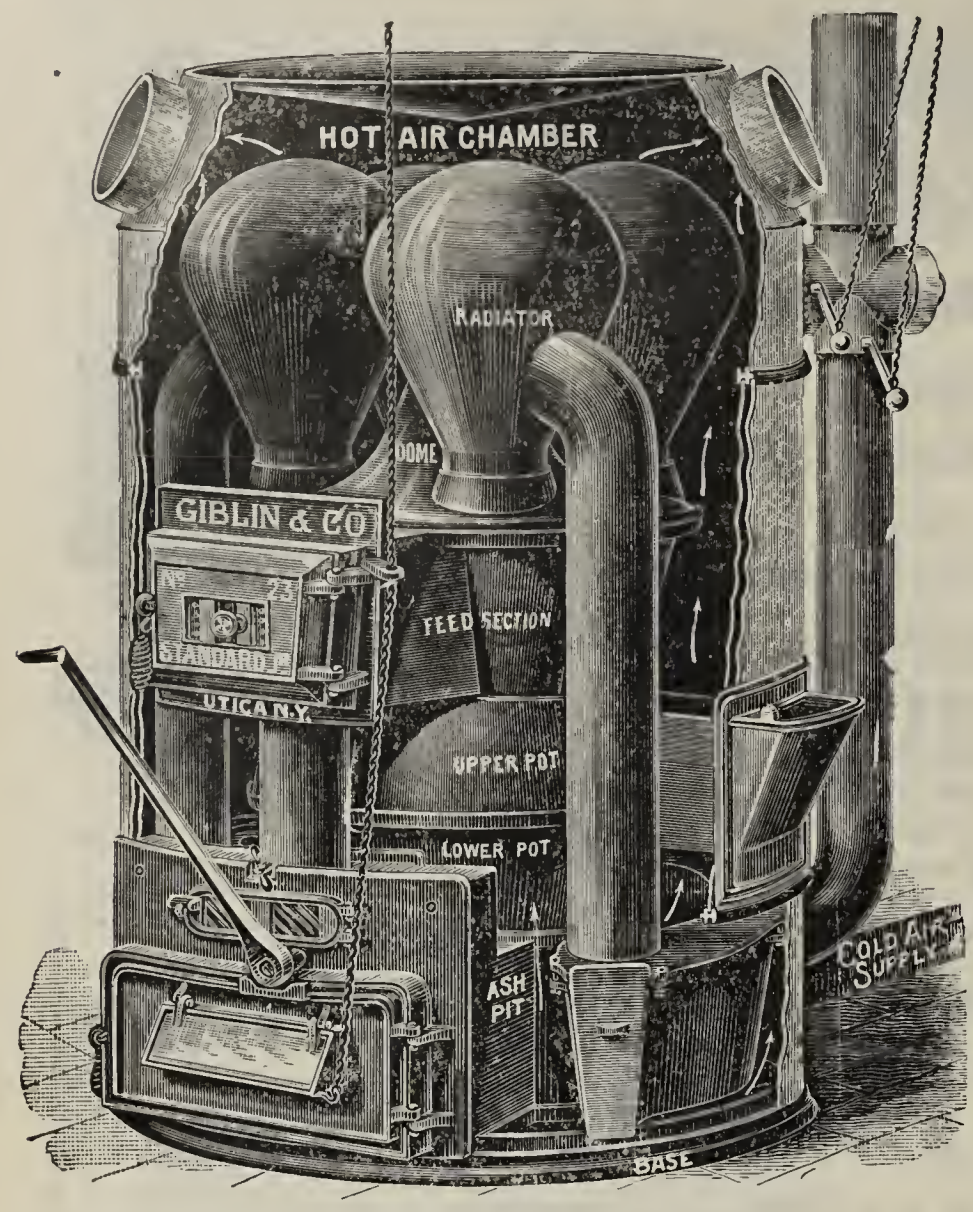
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MADE BY

HOWARD THERMOSTAT CO.

TO HEATER DAMPER OVER PULLEYS.

N. Y. OFFICE— OSWEGO, N. Y. —210 WATER.



High Grade Heaters.

EFFICIENCY

is the first consideration and the construction of our furnaces secures perfect efficiency. A few dollars less paid for a furnace and followed by failure of the system to heat, and the subsequent expense required by alteration will soon convince the dealer that the saving of a few dollars was the most expensive transaction ever made.

STANDARD Jr. FURNACES

are acknowledged to be high grade heaters and are sold and used as such. Dealers who sell these furnaces acquire a reputation for good work and successful heating that brings to them the

CREAM

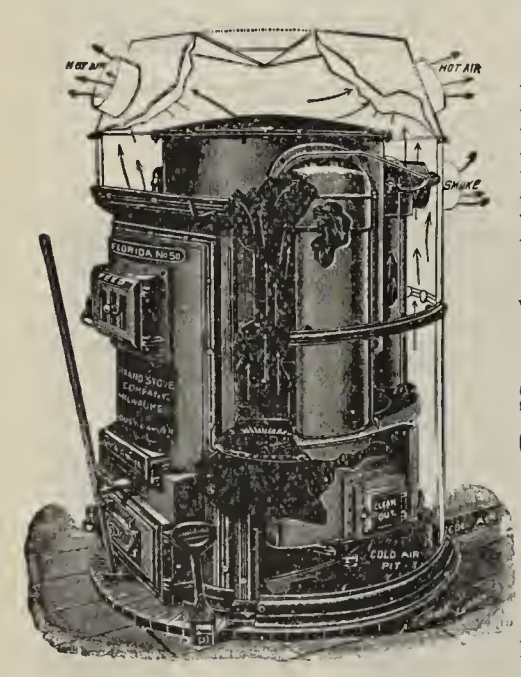
of the trade and enables them to make their own prices.

SEND FOR

GIBLIN & CO.,
UTICA, N. Y.

our catalog which contains full description of our heaters, and our prices are reasonable and quoted on application.

THE FAMOUS FLORIDA.
FOR COAL.



Brand's Famous Furnaces.

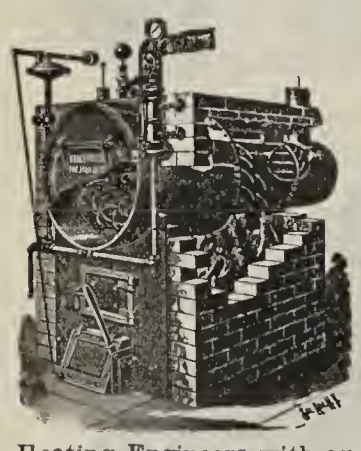
Revertible Flues.
Extra Large Radiator.
Heavy Fire Pot.
Revolving or Flat Grates.
Very Large Ash Pit Door.
Spacious Ash Pit.
Gas and Dust Proof.
Efficiency in Heating.
Large Radiating Surface.
Easy Access to Radiator.
Durability Unsurpassed
Made in 3 Sizes.
38-50-60 Inch Fire Boxes.

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MILWAUKEE. CHICAGO.

THE FAMOUS MAGNET.
FOR WOOD.





Vance Patent Boiler
FOR STEAM and HOT WATER HEATING

for Public and Private Buildings and Greenhouses. Adapted to burn hard or soft coal.

Heating Engineers with an experience of over 20 years.

The Vance Steam Boiler Works,
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Ranges,
Hot-Air Furnaces,
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Cook Stoves,
Heating Stoves, &c.

Write for Catalogue and Discounts.

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BALTIMORE, MD.



Established, 1827.
W. JACKSON'S SONS,
Manufacturers and Importers of
Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.
Office and showroom, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.



The Mitchell Water Heater.

Has no Joints to Burn Out or Leak.

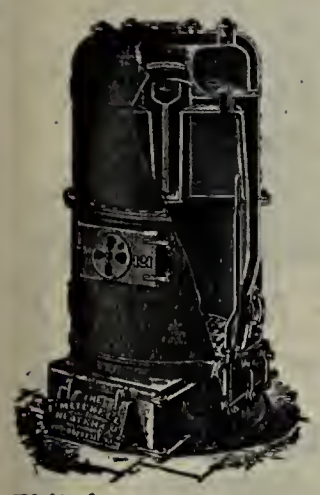
Heating Surface all in One Casting.

Water Passages all Vertical.

Largest Amount of Fire Surface

OUR 100 SERIES

FOR STEAM OR HOT WATER.

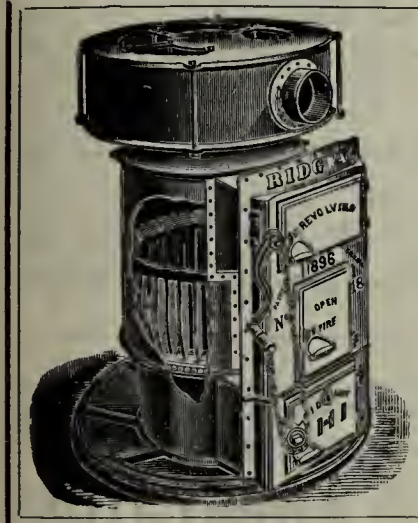


Is constructed on the same general principle, but arranged to be used without jacket.

If you have competition and want to make a low estimate to secure the job, we can help you do it.

Write for . . . . Catalogue and Prices.

THE MITCHELL HEATER CO., 50-60 Pine St., POUGHKEEPSIE, N. Y.

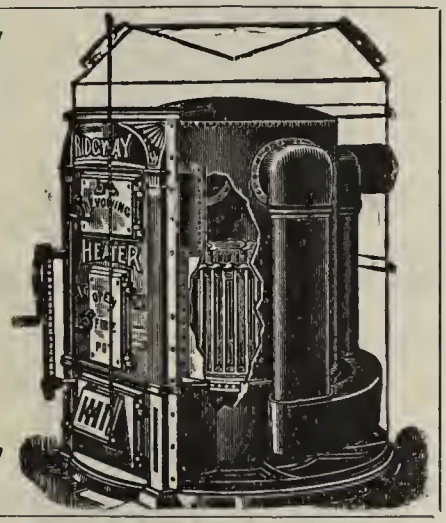


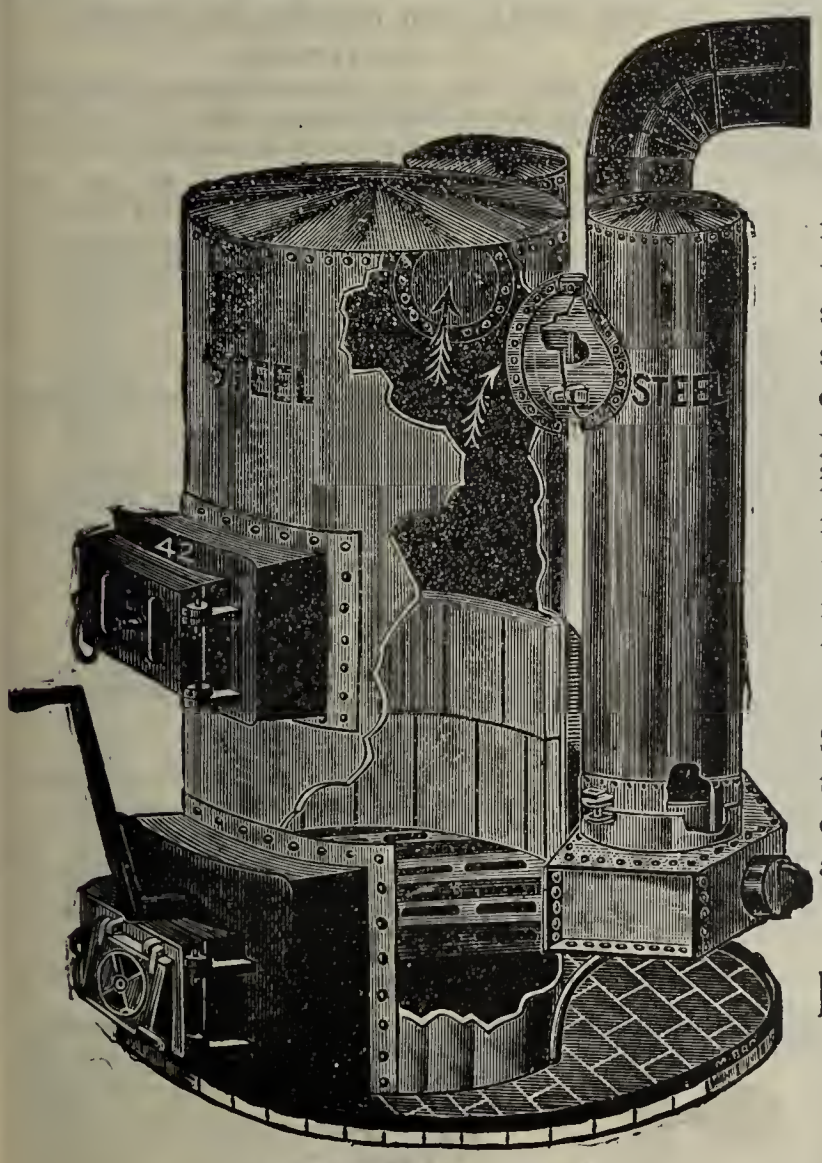
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OPEN FIRE POT FURNACES.

Send for Catalogue.

Ridgway Furnace Co., Boston.





Mr. Dealer:

If you are looking for a furnace which will give the best of satisfaction after it is sold, that can be sold cheap and still show you a good profit, that is superior to any furnace your competitor may secure, then there is no use to look farther.

The Front Rank Steel Furnace leads them all. Write for catalogue, prices, etc., and be convinced.

Front Rank Steel Furnace.

Front Rank Steel Furnace Co.,

ST. LOUIS.

STEAM AND HOT WATER FITTERS' TEXT BOOK.

Prepared for the Steam and Hot Water Heating Course at the New York Trade School, with Supplementary Chapters on House Heating, Specifications and Surface Estimating.

BY

THOS. E. McNEILL.

140 Pages, numerous Illustrations and Diagrams, 5 x 7 in., Cloth, $1.00.

This manual, comprising nearly 200 questions and answers, and other matter, is intended as a Pocket Companion for the Steam and Hot Water Fitter and the Apprentice. The contents are purely practical and the questions or problems set forth are answered in a simple and direct manner.

It begins with first principles and progresses in so thorough a manner that many of the seeming mysteries of steam and hot water fitting can be readily understood.

The various systems of steam and hot water heating are explained, as well as the various appliances and apparatus used with them, and the manner of connecting them is described.

The book supplies in simple form information that is much needed by the trade on determining the size of pipes for flow and return, the amount of radiation, the size of indirect stacks, how to make an estimate of the materials for a job without error, and how to make out a specification and contract.

Plans of various systems are given and a full account of all the details of a successful heating job.

CONTENTS.

Chap 1. Tools, Fittings and Pipe.
" 2. General Questions on Heating.
" 3. Low Pressure Steam.
" 4. Two-Pipe Steam Heating.
" 5. Single Pipe Low Pressure Steam Heating.
" 6. Indirect Steam Heating.
" 7. Hot Water Heating.
" 8. Single Pipe Main System.
" 9. High Pressure Steam Heating.
" 10. High and Low Pressure Steam Heating and Power Plant
" 11. Exhaust Steam Heating.
" 12. Power Fan or Blower System of Heating and Ventilating.
" 13. Design. Estimate. Specification.
" 14. Dwelling House Heating.
" 15. A Successful Heating Job.

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ALL SIZES.

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At this Bargain Package for

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¼	pound.....	2 x 3½
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BOSTON.

MICA

—"I SAY, Darwin," said the author of Audubon's "Birds," "let's play golf."

"Where shall we play?" asked Darwin.

"On the Missing Links, of course," said Audubon. "Where did you suppose?"

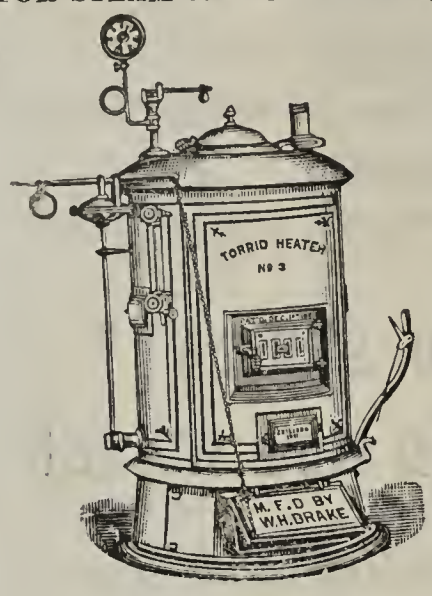
"I supposed you'd be more at home on the Bobolinks," said Darwin.—*Harper's Bazar.*

—COS STICK—I don't see you out riding lately, old chap. You don't mean to say you have got tired of your wheel?

Henry Peck—No, not at all; but, you see my wife has taken my tires for the baby to cut his teeth on.—*Boston Transcript.*

"TORRID" HEATER.

FOR STEAM OR HOT WATER.



IT IS PRACTICAL IN DESIGN.
IT IS SAFE, BEING TESTED TO 200 POUNDS.
IT IS EASY TO MANAGE AND KEEP CLEAN.
IT IS DURABLE.
IT IS SECTIONAL AND EASILY HANDLED
IT HAS NO PACKED JOINTS.
IT IS SELF-FEED OR SURFACE BURNING.
IT HAS THE TORRID PATENT ROCKING AND DUMPING GRATE.
IT IS LOW IN PRICE.

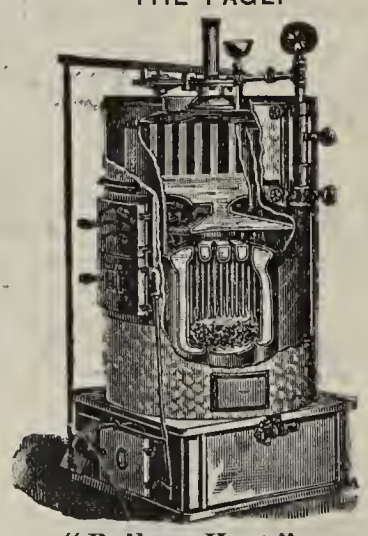
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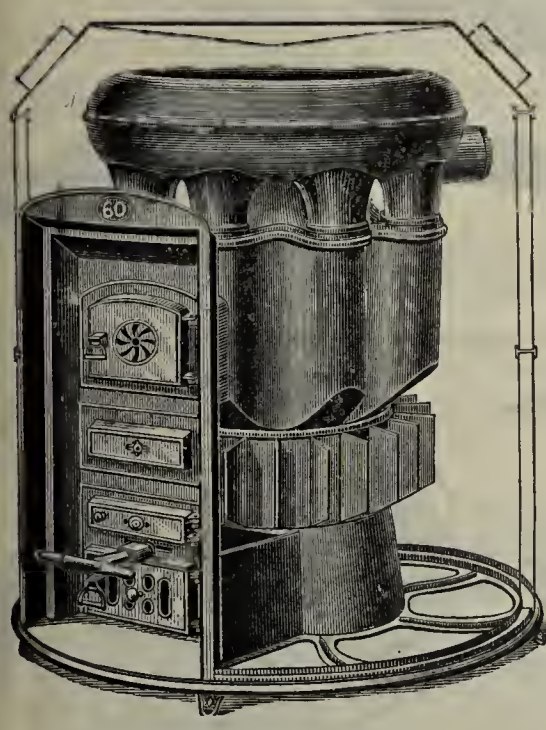
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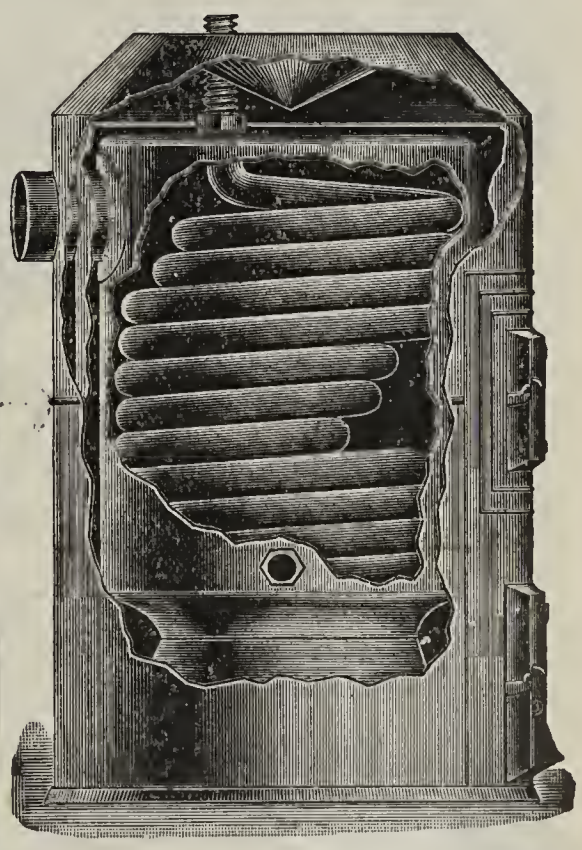
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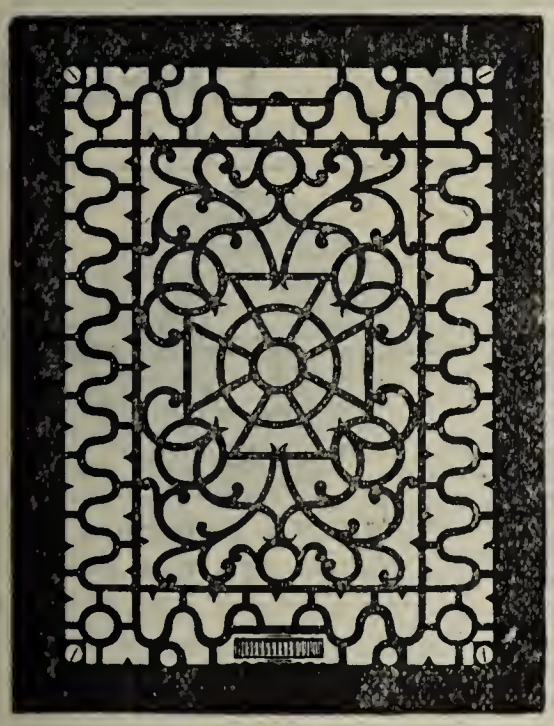
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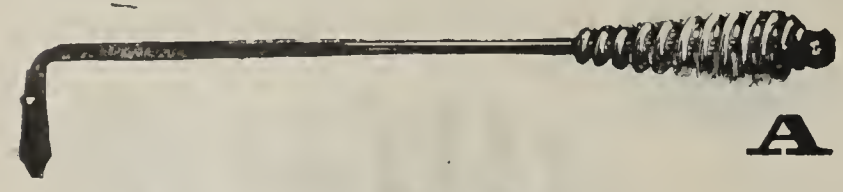
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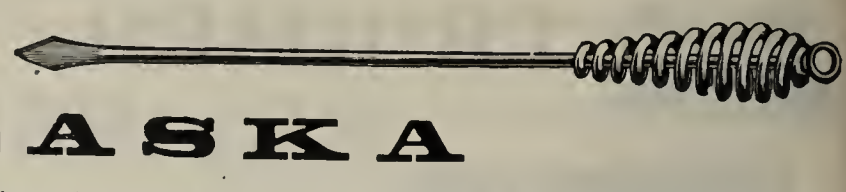
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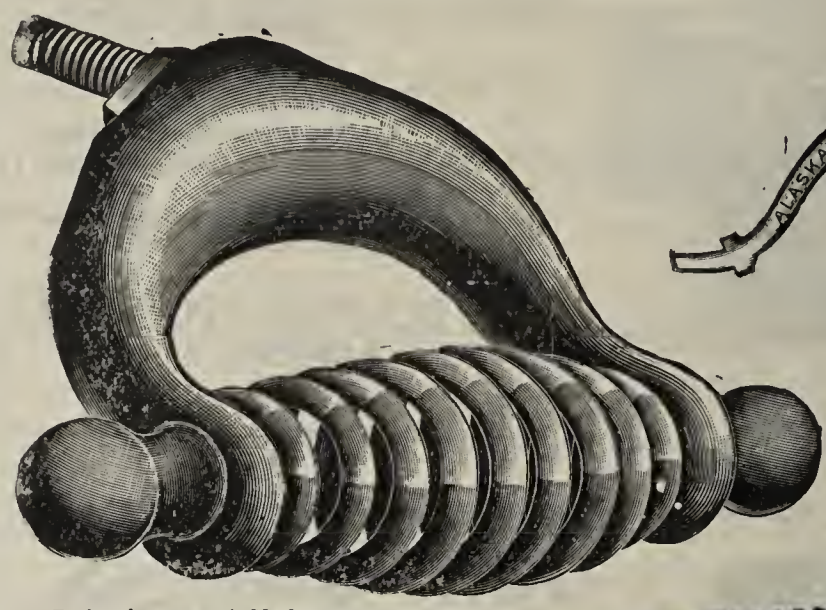
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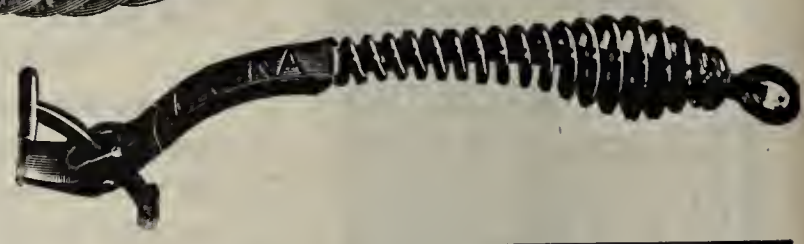
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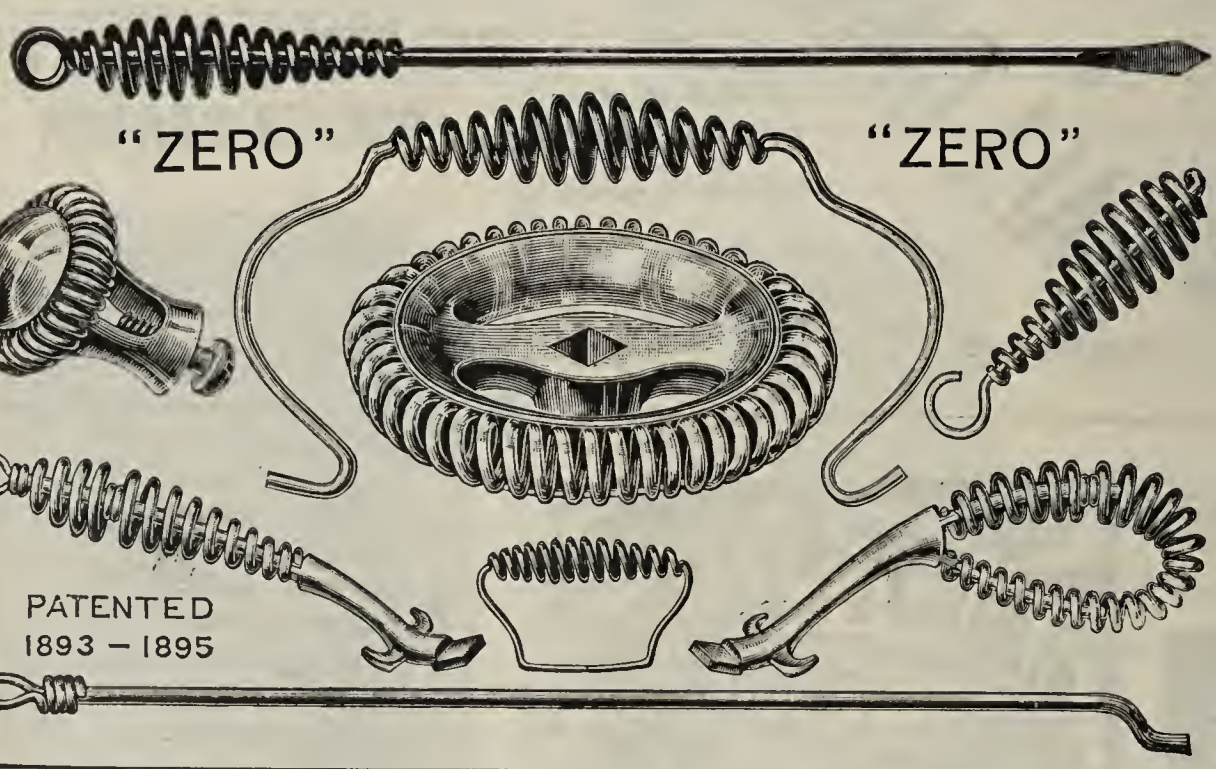


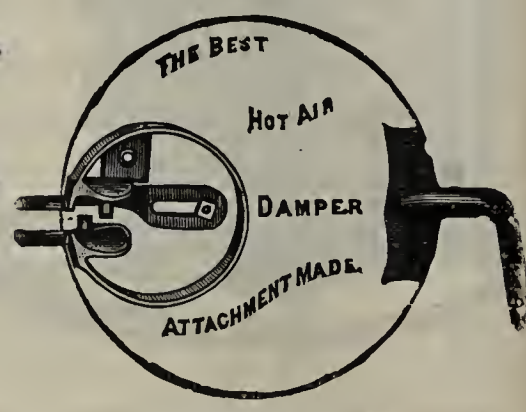
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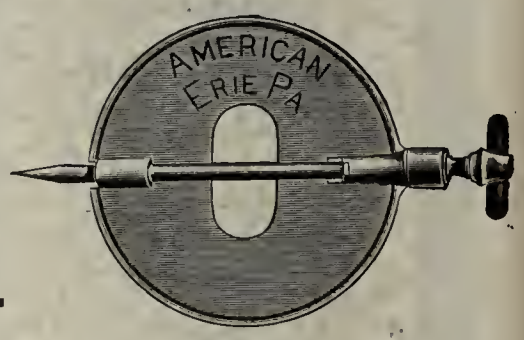
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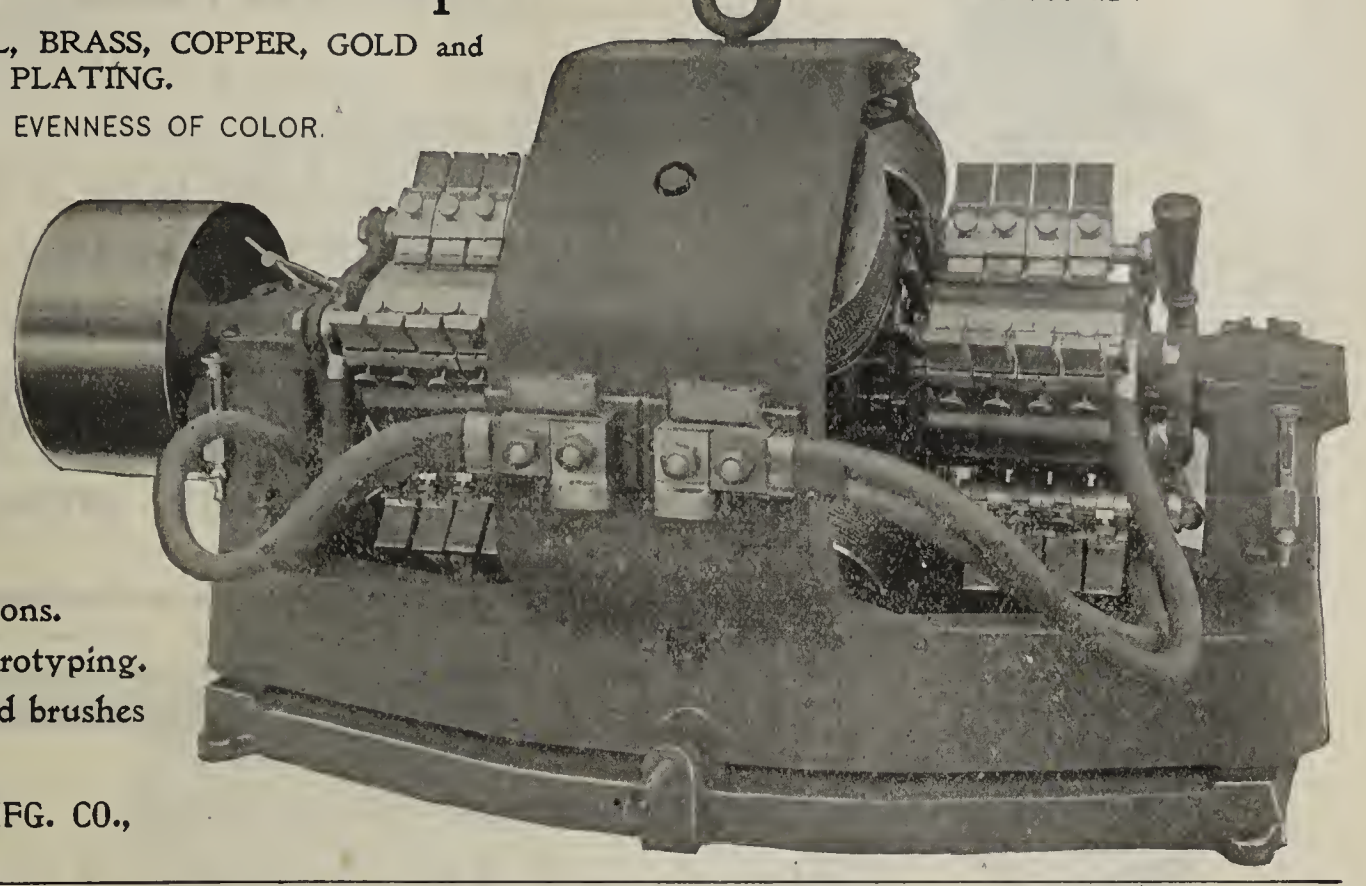
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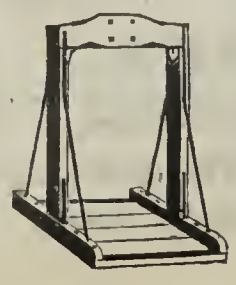
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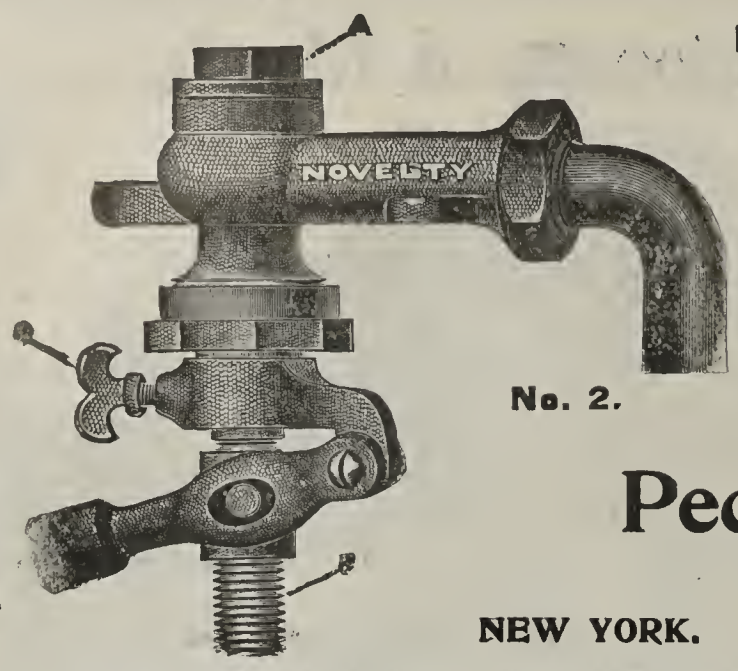
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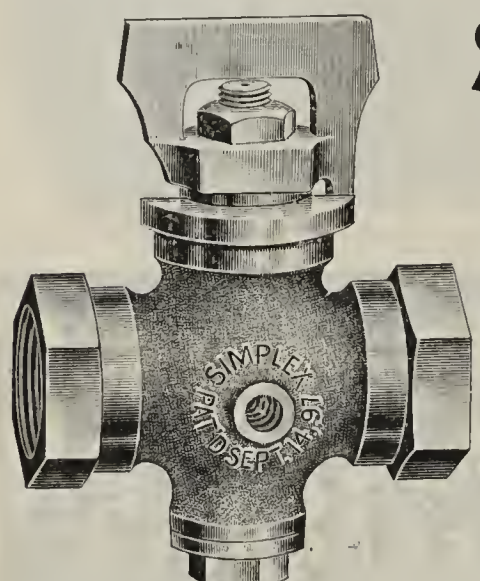
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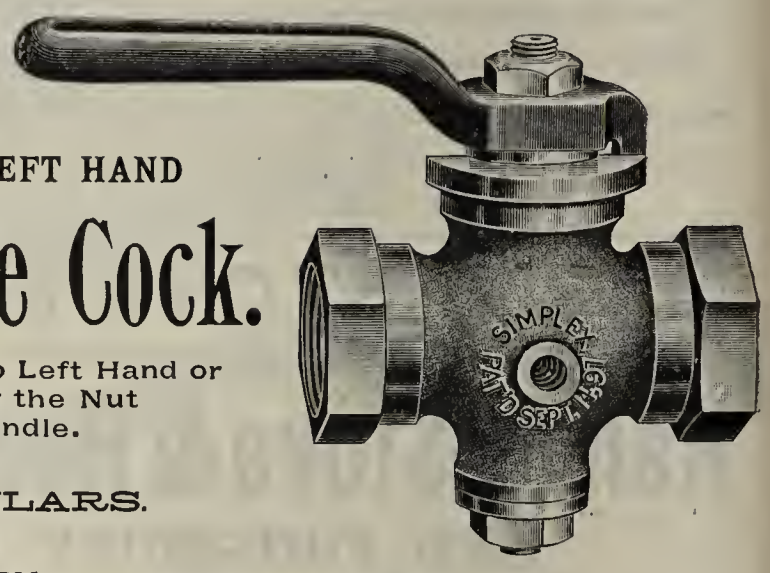
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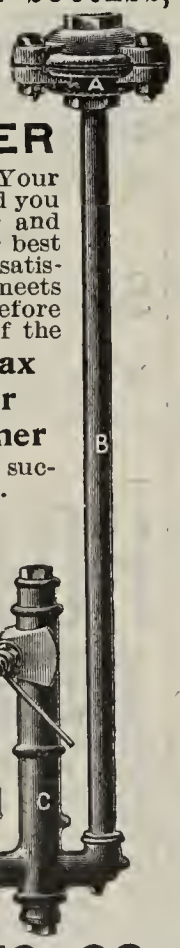
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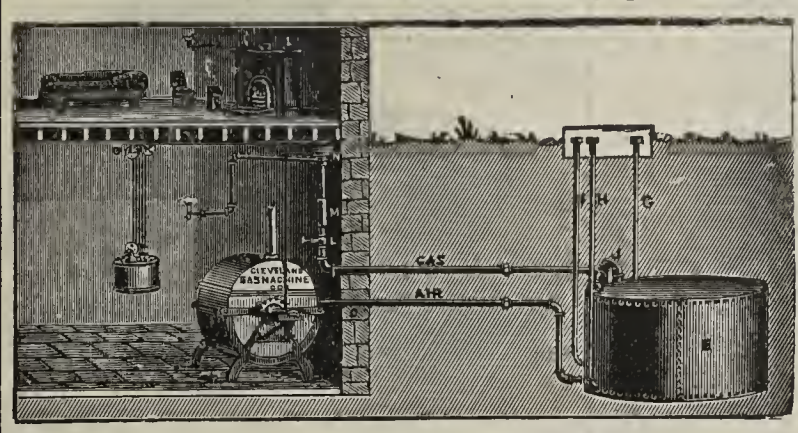
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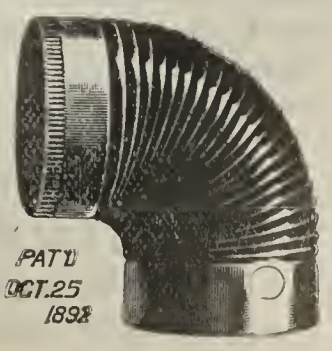
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The Distillation or Manufacture of Coal Gas,
The Distribution of Gas from the Gas Holder Through the Town,
Connecting the Meter in Buildings,
Inspection of Material and Work,
Laying Out Pipe,
Gas Fitters' Tools,
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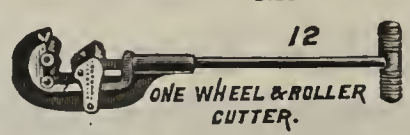
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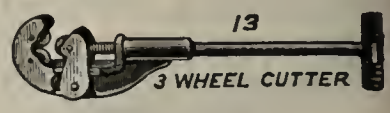
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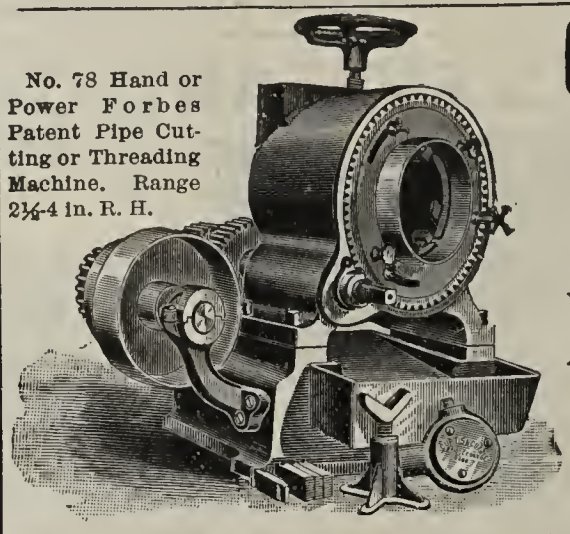
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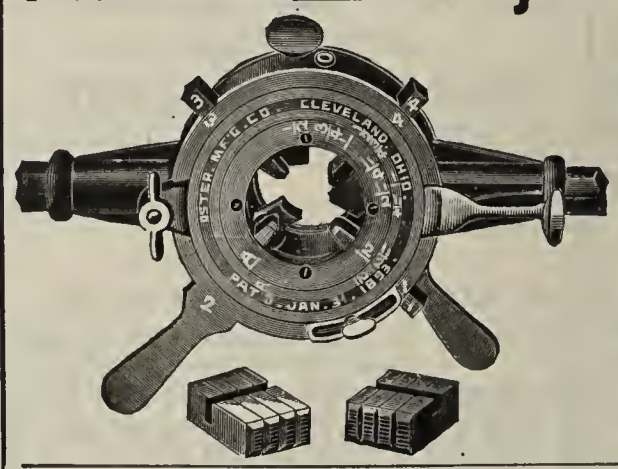
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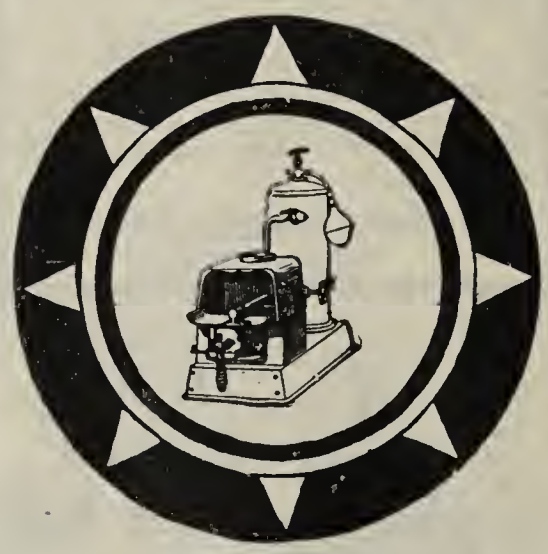
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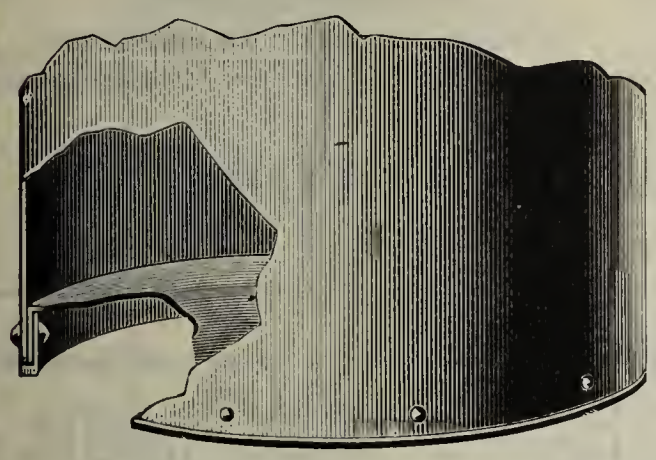


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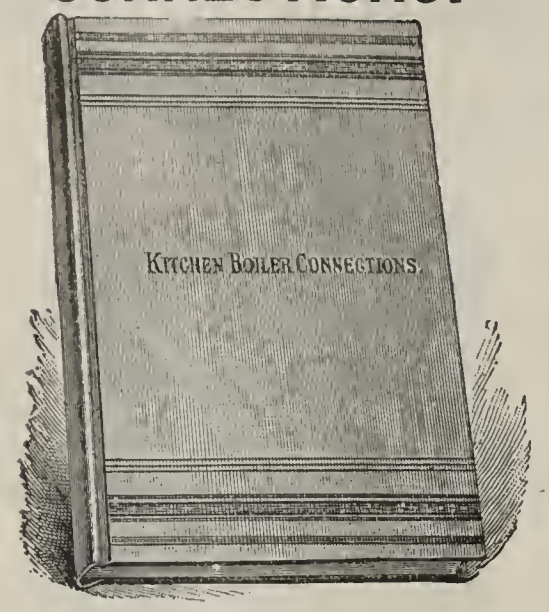
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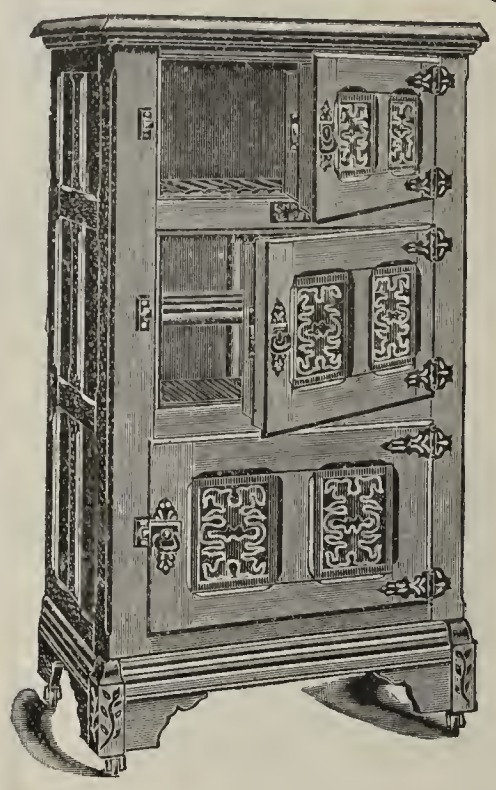
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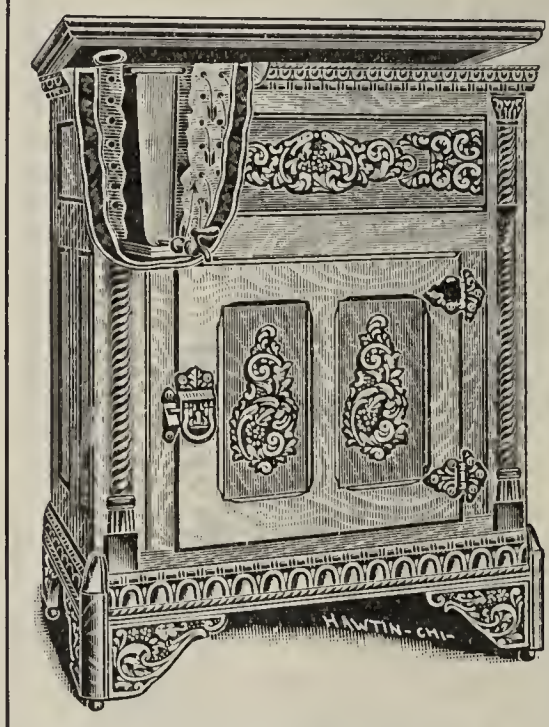
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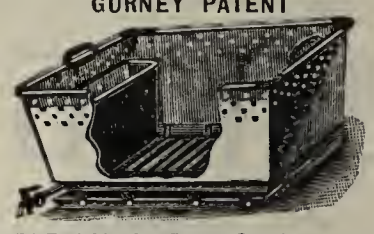
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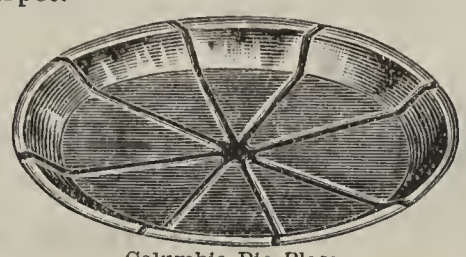
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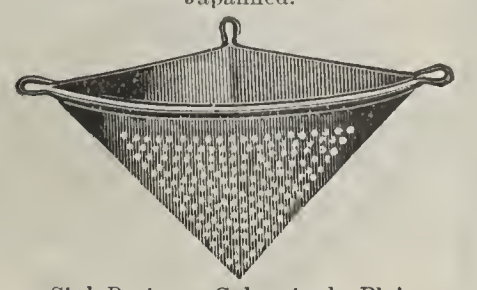
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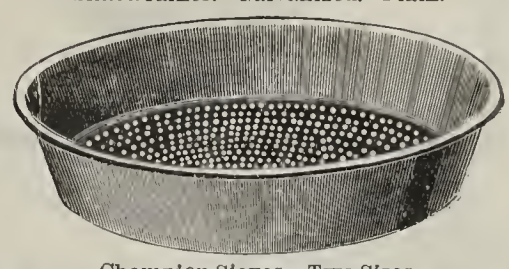
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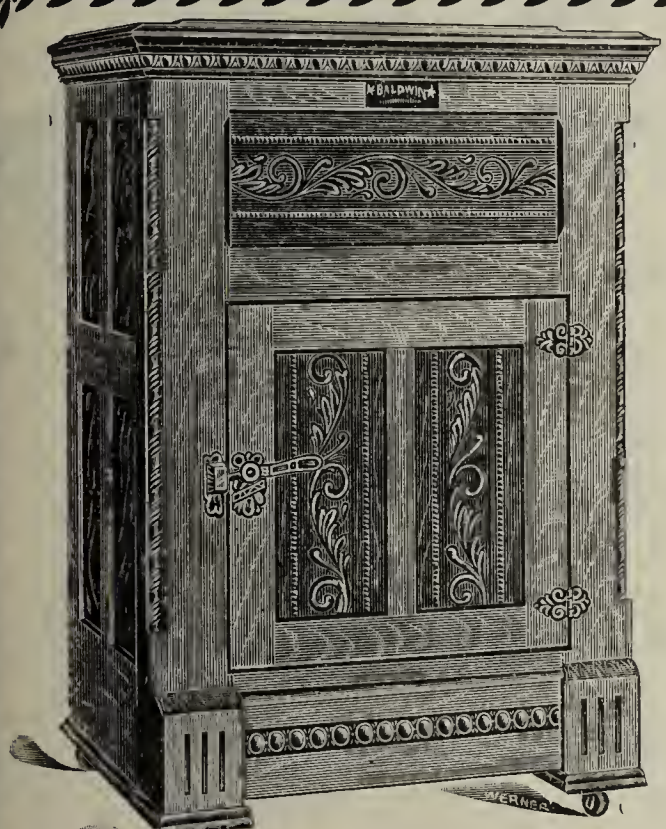
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Guard—Some one pulled the bell and stopped the train, and the boat express ran into us. It will take five hours to clear the line for us to go ahead.

Gentleman—Five hours! I was to be married to-day.

Guard (a married man, sternly)—Look here, are you the chap who stopped the train?—*Tit-Bits.*

—A LADY, who is a city missionary, became much interested in a poor but apparently respectable Irish family named Curran, living on the top floor of a great tenement-house, in the slum district.

Every time she visited the Currans the missionary was annoyed by the staring and the whispering of the other women living in the building. One day she said to Mrs. Curran:

"Your neighbors seem very curious to know who and what I am and the nature of my business with you."

"They do," acquiesced Mrs. Curran.

"Do they ask you about it?"

"Indade they do, ma'am."

"And do you tell them?"

"Faith, thin, an' Oi do not."

"What do you tell them?"

"Oi just tell thim you are me dressmaker, an' let it go at that."—*Harper's Bazar.*



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Gallons	4	6	8	10
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WILL NEST AND PACK CLOSELY.

Crated six each of two or more sizes nested.

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A Practical Treatise on Working Sheet Copper Into All Forms.

By JOHN FULLER, Sr.

Cloth Bound; Size, 10 x 6½ inches; 327 pages; 474 Engravings Price, $3.00.

THIS book is brought out to meet the needs of a body of sheet metal workers whose trade has never before been thoroughly described. The author acquired proficiency in copper working through a long apprenticeship and many years of actual labor at the bench. The instruction he gives is, therefore, entirely practical, and will be correspondingly valued by those who are in any way interested in coppersmithing. A special feature of the work is the illustrations, of which there are nearly 500, and which add much not only to the interest but to the value of the text, as they show the work in all stages of progress and illustrate all the appliances, patterns and tools. The work is divided into sections, each treating a separate topic, and is thoroughly indexed. The style of the writing is exceedingly simple, and the descriptions of work go into the smallest details, a fact that will be especially appreciated by those who read the book for instruction in this handicraft.

"This is a veritable storehouse of information, the descriptive matter and the many illustrations being easy of comprehension. In fact, the whole subject is handled in so masterly a manner that any one with ordinary effort and application cannot fail to understand and appreciate it."—*The Plumber and Decorator.*

"This admirable book has been written with abundant knowledge and a clear head. Mr. Fuller appears to have succeeded thoroughly. His book is singularly simple and clear, and yet very minute in detail."—*Railroad Gazette.*

"The work is the most complete consideration we have seen on this subject, and Mr. Fuller tells his story with clearness and force."—*Fire and Water.*

"The author has so well executed his task that I doubt very much whether any other man living could have done it better. The treatise seems to fully justify his claim that it is entirely practical, and of the publishers, that it is exhaustive; since few will be able to name any article made of sheet copper the practical construction of which, or of some strictly analogous article involving the same methods, is not fully and clearly described in the book, from the laying out of patterns through all intermediate steps and processes to its final completion. The book is a much needed and welcome addition to modern technical literature, and should at once be placed in every up-to-date trade school and technical library."—*Engineering Magazine.*

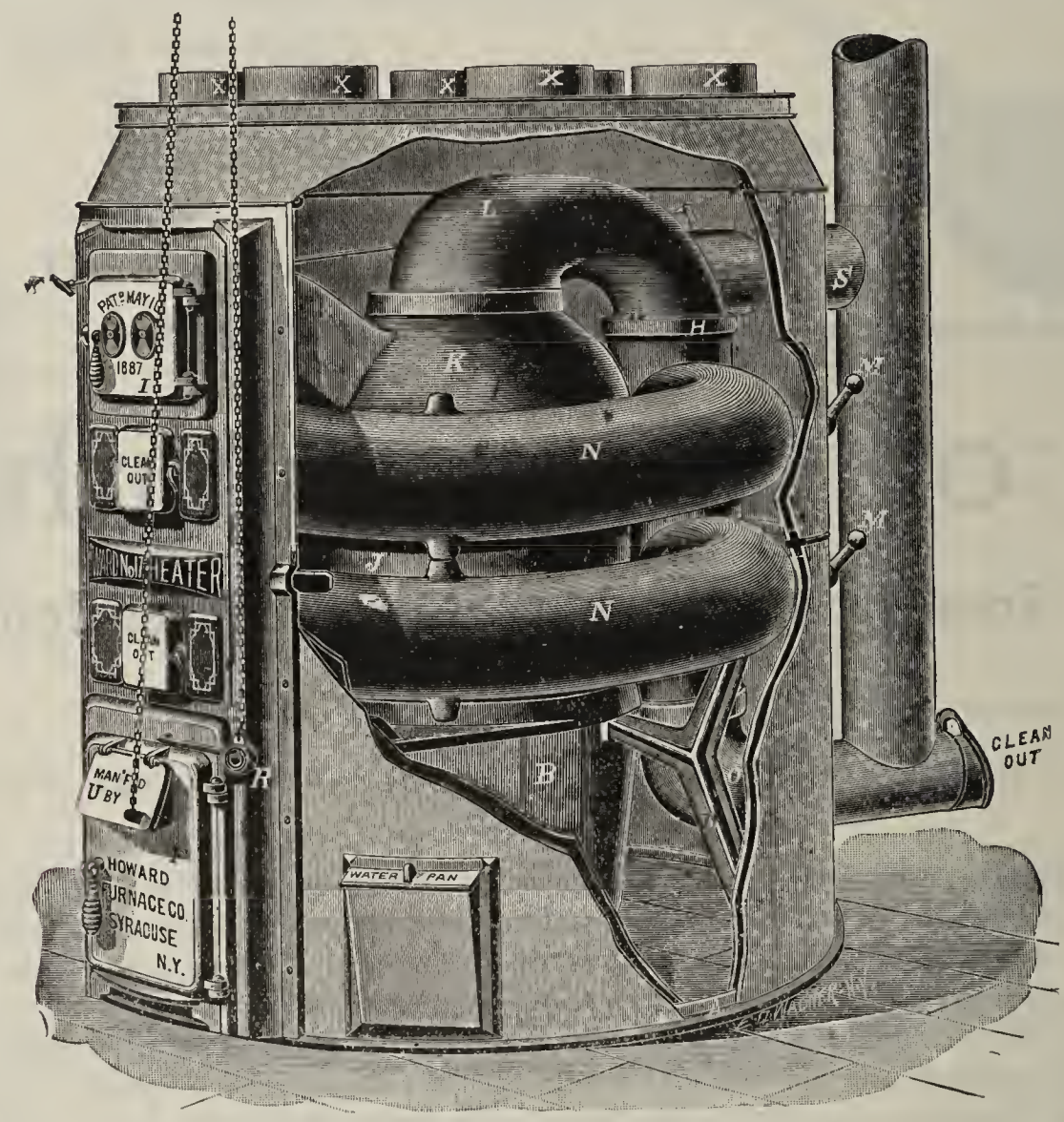
"Mr. Fuller has happily succeeded in a most difficult task, that of writing a book that is at once a practical reference book, and is at the same time a most readable and interesting one—even to those not especially interested in the subject treated. An evident love for the subject permeates the entire work. We must say a good word for the numerous illustrations, which are lucid and simple."—*American Artisan.*

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Furnace plate is forced to be raised to a higher degree of temperature under this construction than is possible to obtain when located away from the fire. It varies inversely as the square of the distance from the fire for effectiveness. This is illustrated by heating water near a fire and away from it. The same holds good with furnace plate for heating air. For this reason the Howard is made with a low combustion chamber.



High Combustion Chambers

are not fire surfaces. They lose in effectiveness in proportion to the space they occupy. It means practically a waste of iron. In other words paying for more material than is actually needed.

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THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, January 15, 1898.

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Volume XLIX.....No. 3.
Index to Reading Matter.....Page 49.

The Business Situation.

From all parts of the country come reports couched in the same tone, one of quiet confidence in the business outlook. The opening weeks of the year, while naturally a period of more or less restricted distributive trade, have seen active preparations for busy times ahead on the part of merchants and manufacturers. Activity, commercial and industrial, is looked for with an assurance not felt for years past, and a generally hopeful feeling pervades trade circles. The week just closed witnessed a distinct revival of activity and of cheerful confidence in Wall street, with prices of securities materially higher than at the opening of the year. An encouraging feature of the stock market was the renewal of heavy investment buying by the public and large purchases of American securities on foreign account, indicating confidence in the financial situation. Last week's record of bank clearings showed a remarkable volume of business, surpassing the figures of any previous week. New York's clearings alone, which were the heaviest ever known, amounted to over $1,000,000,000, exceeding last year's figures for the corresponding week by 37.4 per cent. and the first week of 1892 by 10.7 per cent. Outside New York the amount for the five days was over $536,000,000, bringing the aggregate clearings for the week above $1,679,000,000, an excess of 11.4 per cent. over 1892, the last really active business period. A satisfactory feature of the week's business, which tended to swell the amount, was the very unusual promptness and volume of the January commercial settlements, which were the heaviest ever known here. Railway earnings make a most gratifying showing, being over 12 per cent. better than a year ago. Encouraging activity is noted in the iron trade. The enormous production of pig iron which is going on, amounting to nearly 1,000,000 tons a month, is accompanied by a rapidly growing demand which promises to absorb the entire current output, and the possibility of a shortage during the current year is being seriously discussed. Prices of products are without important change in any direction, but the general tendency is toward firmness all around, with advances in a few directions. The metal trade remains quiet, but pig tin has advanced under the influence of a better demand, and lead is decidedly stronger. Exports, although comparatively light after the extraordinarily heavy December movement, are still going out in good volume. Grain shipments last week were 10 per cent. above those of the corresponding week of 1897, and the foreign demand for breadstuffs promises to keep up in good volume.

Southern Progress.

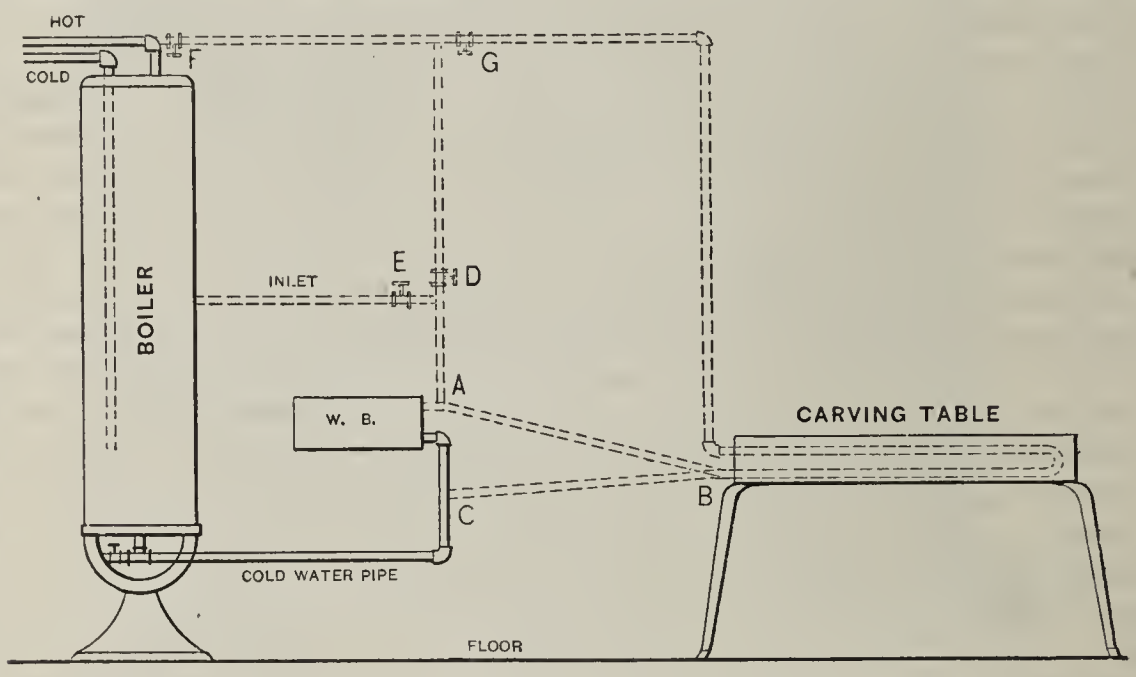
In spite of two very serious drawbacks—the yellow fever scourge, with its accompaniment of quarantine restrictions, and the low price at which cotton has been selling—the year 1897 was one of material progress in the South. That section of the country has been making substantial advances along many lines of commerce and industry in a quiet but steady fashion for the past few years. The business depression of 1893-1896 was less felt in the Southern States as a whole than in any other section of the country. Consequently they were in good shape to benefit by the improvement in general trade which was developed last year, and in that improvement they took their full share. A notable development, which holds the promise of important material advantage to the South, is the extension of cotton manufacturing in that region. This movement received a considerable stimulus last year, a number of cotton factories having been erected or their construction begun, while negotiations are now on foot looking to the transference of some leading interests in this line from New England to the South. With cotton factories established right alongside the field of supply of the raw material, the South promises before long to come to the front as the leader of the world's cotton goods business. At the same time the Southern iron industry has been making noble strides. Its production of pig iron in 1897 is estimated by the *Tradesman* to have reached 2,250,000 gross tons, or 450,000 tons more than the product of 1896. The comparatively cheap cost at which the Southern iron masters have been able to produce their iron has enabled them not only to extend their sales throughout this country, but also to make a beginning of what promises to prove a very large foreign trade. Along with the growth in iron production, new mills, foundries and machine shops have been established throughout the South, and are gradually filling the needs of that section for iron and steel products. Moreover, there has been a marked increase in diversified industries, as well as in a diversification of agricultural products, a very important point in offsetting the tendency to overproduction of cotton. The timber and mineral resources of the South are being developed very satisfactorily. Wood working factories are growing in numbers, and the furniture manufacturing business is becoming a leading industry of the South. Some of the products in this line have already found an export outlet. The Southern coal trade of 1897, with an estimated output of 30,000,000 tons, was the largest by far in its history, as was also the manufacture of coke in West Virginia. Railway facilities have been extended and improved to a notable extent, and the Southern States are now as well supplied with transportation facilities as almost any section of the country.

THE LETTER BOX.

Connecting Range Boiler with Carving Table.

From H. & H., Bedford, Quebec.—Will you please inform us the best way to make connections with a carving table so as to heat from a range boiler? The inlet to the heating coil in the carving table is 10 inches lower than the outlet of the water back. We show in the sketch presented herewith the relative arrangement of the water back, heating coil in the carving table, and the boiler. The heating coil is to be submerged in the water chamber of the carving table.

Answer.—The pipe from A and B, as shown in the dotted lines, should be removed. As it is likely that at times the fire will not be sufficient to furnish the hot water required in the boiler and to heat the carving table at the same time, it is best to arrange the carving table so that either one or the other may be used as required. A pipe should run from A to a point level with the inlet at the side of the boiler, where a branch should be carried



Connecting Range Boiler with Carving Table.

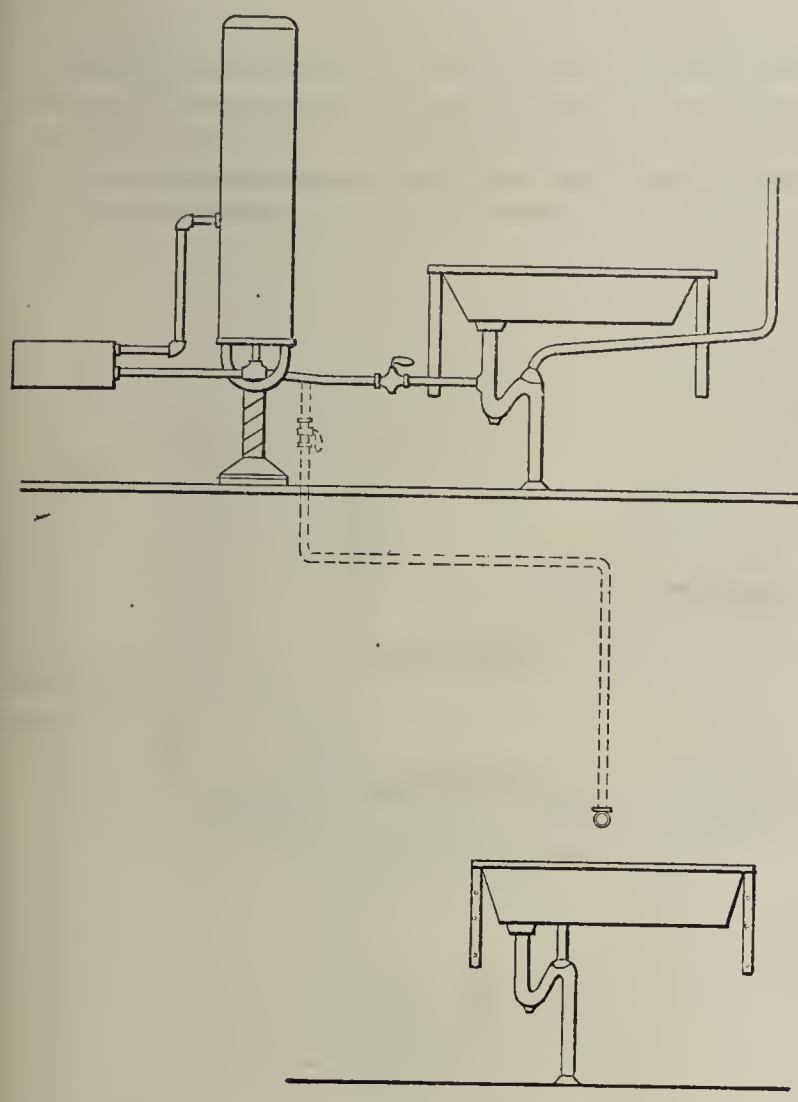
over to the boiler. The upright pipe should then be carried up to a point level with the hot water service pipe at the top of the boiler, and here a T should be placed and from one side of the T connect the hot water service pipe. From the other side of the T a pipe should be carried over to a point above the inlet to the heating coil in the carving table, where it should drop down and connect with the coil. The return from the heating coil in the carving table should be brought over from B and connected with the cold water pipe from the boiler at C. If the water back has sufficient power to heat both the boiler and the carving table it is quite probable that if used for the carving table alone too much heat would be generated at the carving table unless the coil was very large. For this reason a valve should be placed on the vertical pipe at D, so as to force the circulation into the boiler and then up through the boiler to the hot water service outlet, when it would cross over to the heating coil and return to the coil and the water back through the pipe connected at C. If it was desired to shut out the boiler entirely a stop cock should be placed at E and another at the top of the boiler at F. Then by opening the cock D the circulation would be through the vertical pipe and over to the pipe which dropped down to the heating coil and through it back to the water back. Any expansion in the water heated would work through the cold water pipe in the boiler against the service pressure. By leaving out the stop cock at D and placing a stop cock at G the pipe connecting with the side of the boiler might be omitted, which would enable a quicker supply of hot water to be secured.

Is It Dangerous?

From H. J. P., New York.—I have seen the letters of "O. & P.," in *The Metal Worker* December 11, and of "J. T.," December 25, 1897, in reference to connecting a water service pipe with the house drainage system, and while I have never seen just such a connection as is presented in the article of "O. & P.," that which is described by "J. T." as being desired by his customer is common practice in New York. It is not only desired by the general public, but also by the plumber. If a plumber is sent to a house, and in order to make repairs it is necessary to empty the boiler, it is a slow and tedious job to empty the boiler a bucketful at a time after the water supply has been cut off. It can be done quicker and with far less labor if the sediment cock under the boiler is connected by means of a pipe with the sink waste, and from the fact that in the best jobs of plumbing in the finest houses in New York such a connection is made, it would seem that it is not objectionable from a sanitary standpoint. My experience in the plumbing business covers a period of more than 25 years and I do not know when I first saw such a connection, but that it is common is well known to all who have worked in New York City. Up to the present time I have heard no complaints of sickness resulting from this practice.

From Oliver Twist.—The connection of the sediment cock or blow off pipe from the range boiler to the sink waste is one of common occurrence, but not in the manner shown in the sketch accompanying the letter of "J. T.," Hackensack, N. J., in *The Metal Worker* of December 25. When connected as shown in the sketch herewith it conforms to the regulations of most cities. Connect it on the house side of trap, with the stop cock as close as may be convenient to the waste. The objection is raised that if the stop cock be left open, &c. Suppose the plumber in cleaning the main trap of the house in cellar or basement forgets to replace the cover of the hand hole. What would happen? Both are acts of negligence, and should not occur. Even if the

cock be left open for a while it will be seen by the accompanying sketch that the sewer gas is intercepted by the sink trap. If it can be done, however, it would be preferable to use a few feet more pipe and continue to the basement, where it would terminate with a flap valve over a sink or other trapped fixture. In some cases it will be necessary, in order to obtain a fall from the boiler, to lower the sink trap so as to be able to connect on the house



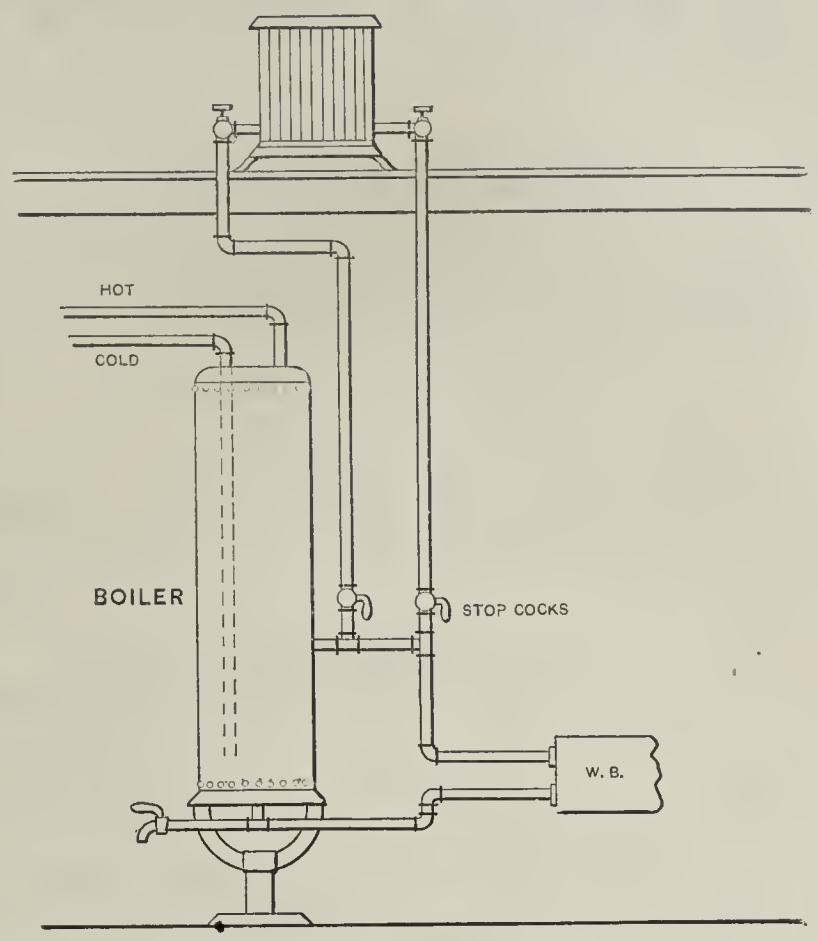
Is It Dangerous?

side of it, but it will be only a few inches at most. The dotted lines show the blow off connected to sink in basement.

Heating Radiator from Range Boiler.

From E. G. H., Pottsville, Pa.—I saw in the book entitled "Kitchen Boiler Connection" an arrangement to heat a room from a boiler with hot water, and have arranged the system as shown in Fig. 1, which seems to work first class. I think, however, by connecting the return pipe at the top of the boiler and the hot water pipe, as shown in Fig. 2, it would work still better than when the return is carried to the side of the boiler. It is generally claimed that water can be heated quicker by connecting the hot water pipe from the water back to the top of the boiler instead of on the side. With the method shown in Fig. 2 the pipe that leads to the side of the boiler is to be used only in the summer time, when no heat is required in the radiator above. This pipe might run across at the top of the boiler, but the connection at the side of the boiler seems to give satisfaction for ordinary hot water service. I should like to know which of the two methods of piping is preferable.

Note.—Doubtless some of our readers who have systems in operation could give some information on this subject. Of the several systems illustrated in "Kitchen Boiler Connections" our correspondent has taken one which was open to some criticism. Of the two systems which he refers to, that shown in Fig. 2 is the better one. Both, however, might circulate more freely if there was not a possibility of the hot water on rising separating and flowing in both the flow and return pipes to the radiator. Under ordinary circumstances the hot water will rise in the first pipe that affords an opportunity, although in Fig 1 the flow and return connections are so close together that hot water might rise in the return pipe and impede the circulation. In Fig. 2 there is less possibility of trouble from this cause. In the system shown in Fig. 2 the hottest water would immediately rise to the radiator, and on cooling would return to the boiler, and the circulation of the system would take place through the boiler.



Heating Radiator from Range Boiler.—Fig. 1.—A System in Use.

In this way the hottest water returning from the radiator would be stored in the top of the boiler for use for domestic purposes. This method would insure the best efficiency of the water back for heating the radiator, but might interfere with the supply of hot water for other purposes.

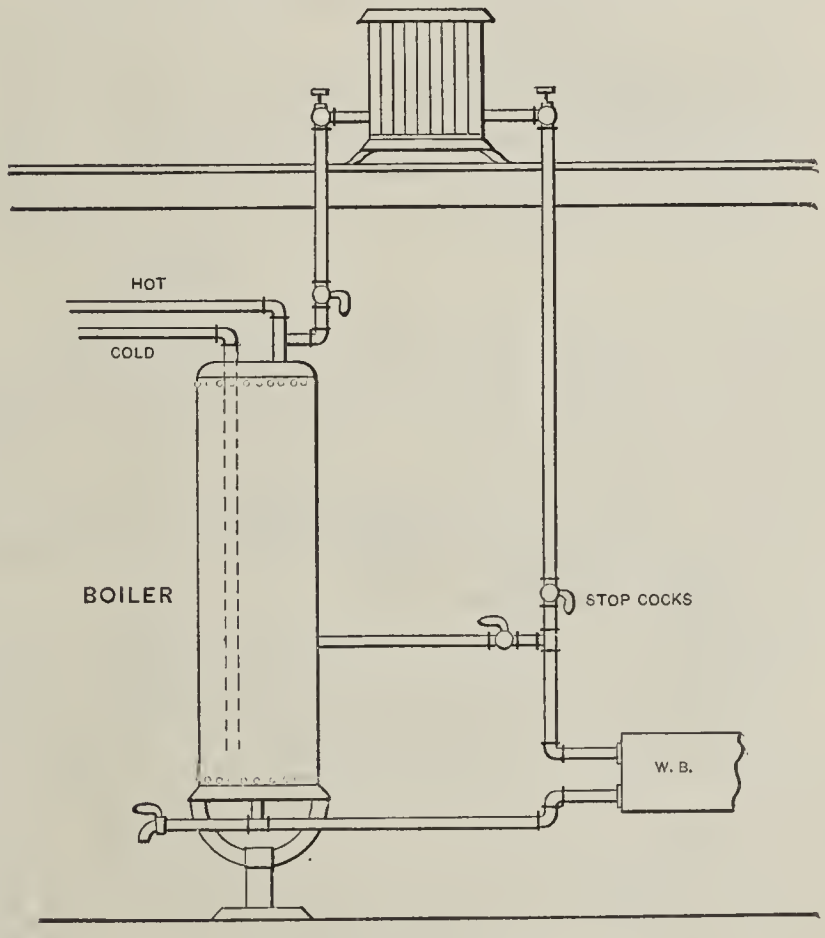


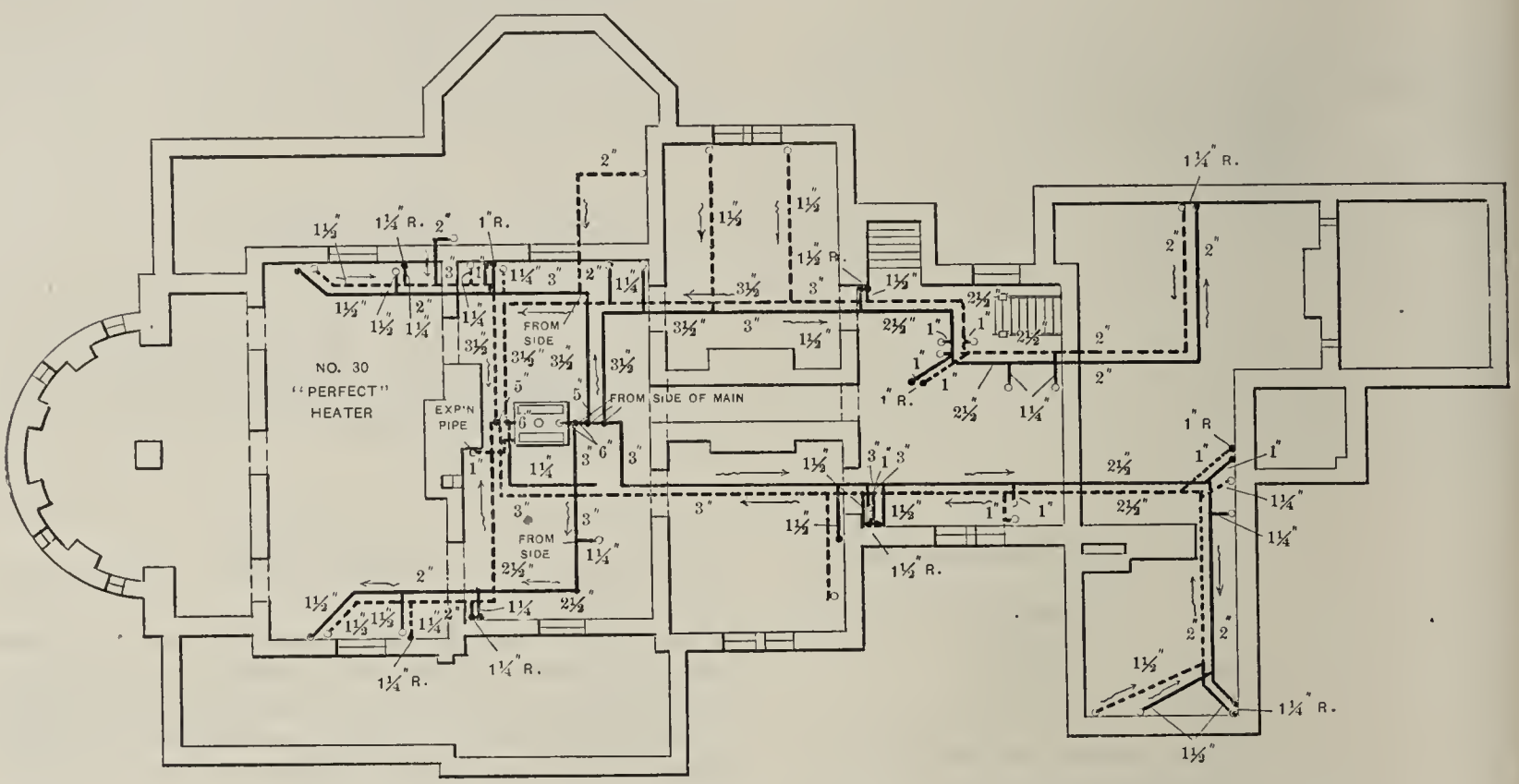
Fig. 2.—A Proposed Change.

Should such a condition arise, the return from the radiator should connect direct with the lower pipe at the water back, and the valve on the pipe supplying the radiator could be closed sufficiently to cause a circulation through the boiler as well as through the radiator. Connecting a water back, a boiler and a radiator affords opportunity for making many combinations, and the conditions and requirements make a satisfactory arrangement in one case open to improving changes in another.

HEATING AND PLUMBING.

A TWO-PIPE HOT WATER SYSTEM.

The question of exposure is one that receives careful attention from the competent heating engineer, and ample radiation is supplied to meet the cooling effects of the outdoor atmosphere on buildings which are located in exposed situations. The residence of Mrs. Thomas L. Kane, located on the side of a mountain at Kane, Pa., is so situated that the heating system must be equal to warming the building not only under conditions of extremely low temperature but also where the exposure increases the work to be done. The heating system, installed by the Kane Plumbing Company of Kane, Pa., is of the two-pipe hot water type, using a No. 30 Perfect boiler, made by the American Boiler Company of Chicago and New York. Fig. 1 is a plan of the basement of the building showing the location of the boiler and the method of piping. Fig. 2 is a plan of the first floor giving the dimensions of the different rooms heated and the proportion of radiation to the space heated. Fig. 3 is a plan of the second floor, which also gives the location of the radiators, the space heated and the ratio of radiation to the space heated.



A Two-Pipe Hot Water System.—Fig. 1.—Basement Plan, Showing Arrangement of Mains and Branches

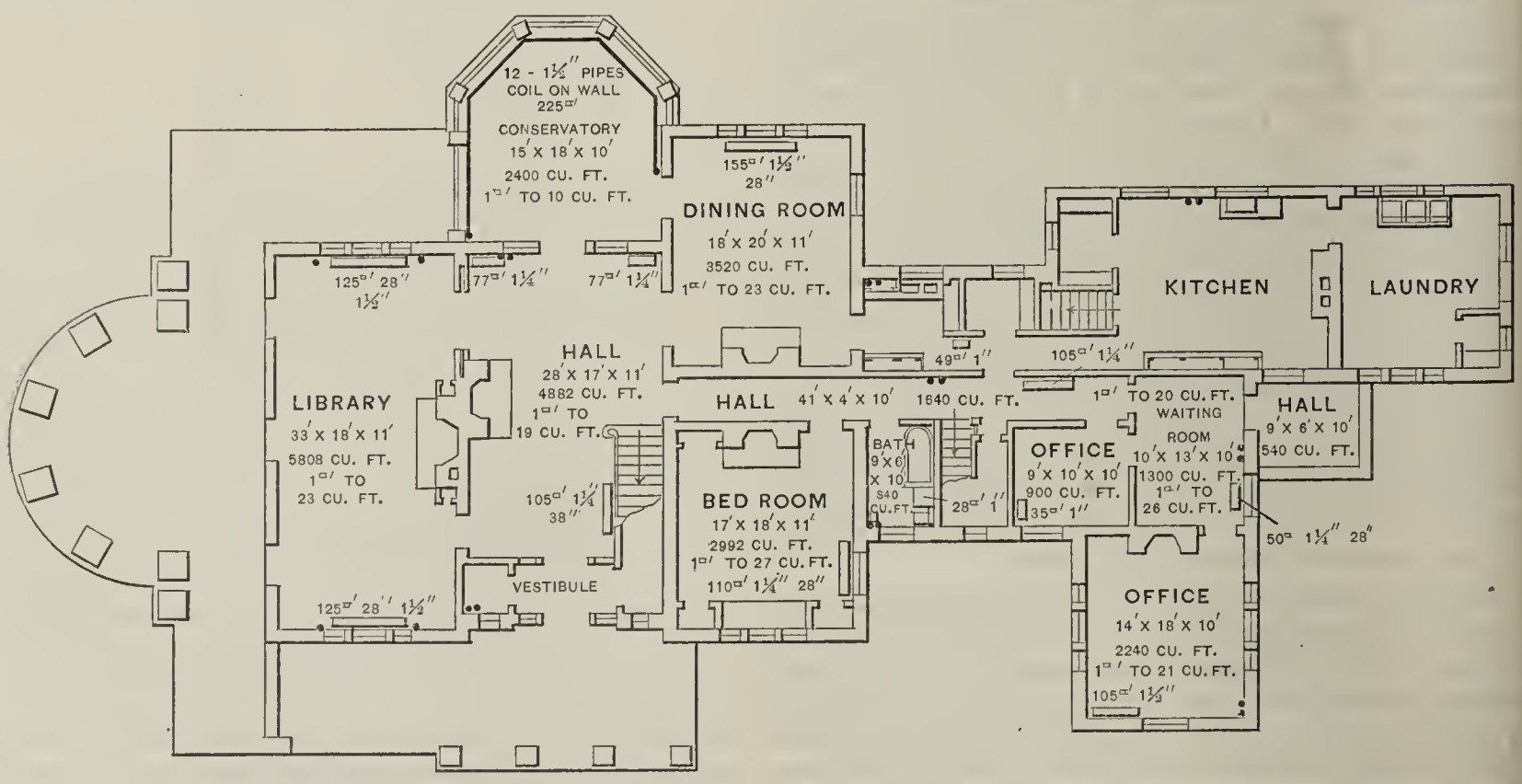


Fig. 2.—Plan of Firs. Floor.

In this plant a special tapping is provided in the boiler so that a 6-inch flow main is taken off the front of the boiler, which is at the right side of the plan. From this main the various branches are taken as shown. The re-

turns from the various radiators are also shown and their sizes given. The returns are indicated on the plan by a dotted line nearest the wall of the building. With this information the student of this heating system may more readily follow the piping arrangement. The radiators used are of the Zenith pattern, made by the Titusville Iron Company, Titusville, Pa., and 152 Centre street, New York, so that in addition to the direct radiation afforded the flue construction of the radiators secures a circulation of the air in the room. On the first floor there is a conservatory, in which is a coil having 225 square feet of surface, and it will be noticed that 1 square foot of surface is provided for each 10 cubic feet of space in this conservatory. It will also be noticed that the radiation provided in the first-floor rooms, with the exception of the bedroom, is 1 square foot to about 23 cubic feet of space, except in the main hall, where more radiation is provided, inasmuch as it is expected that some heat will be lost in passing to the second-floor hall. On the second floor the proportion of radiation to space heated is 1 to 27, with the exception of the larger nursery, where the proportion is 1 to 22, three sides of this room being exposed, and it has therefore been

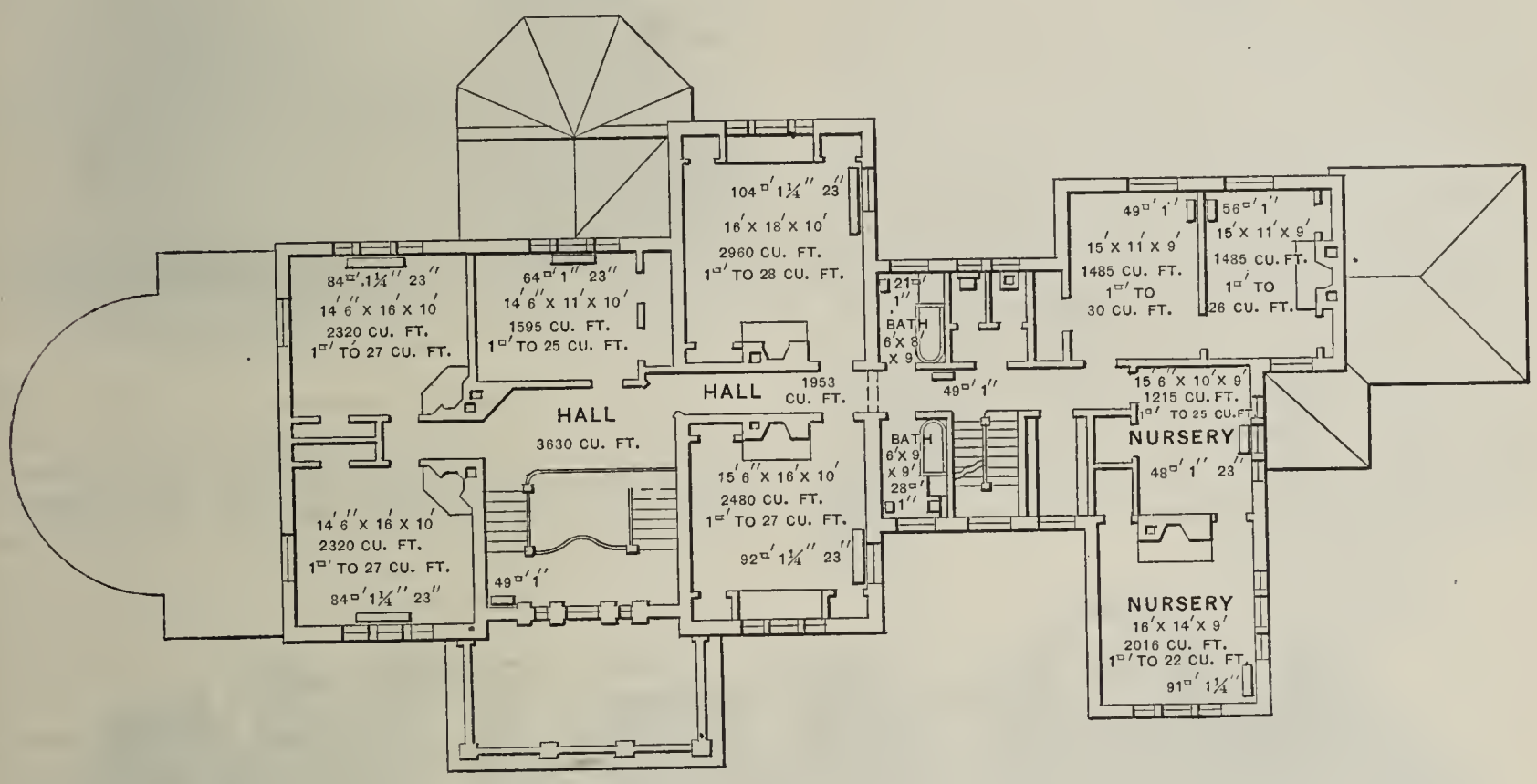


Fig 3 — Plan of Second Floor.

deemed necessary to provide ample warmth for the little folks who are to occupy this room. In addition to the space heated, shown on the plans, a room containing 2267 cubic feet of space on the third floor is heated also by a radiator, and in this room the expansion tank is placed with a pipe running to the basement, where it is connected with the return at the boiler. The expansion tank is of the closed type with a vent pipe leading out of doors so that steam or vapor may readily pass off. From the side of this vent pipe an overflow pipe is taken which leads to a place where the discharge can do no harm. Owing to the expansion tank being placed in a room that is warm it has not been deemed necessary to connect a pipe from the flow main with it to secure circulation and keep it heated.

In connecting the branches from the flow main, in the majority of cases they are taken from the top, except where the branches are connected with the main at the boiler, when they are taken from the side. The branch which supplies the heating coil in the conservatory is also taken from the side of the main which supplies it. Additional interest will be taken in this heating system and the information it may convey to the reader studying it, owing to the fact that it has now been in successful operation one season, having stood the test of last winter.

The Miller-Ware Automatic Heating Company of Buffalo, N. Y., have been incorporated, with a capital of $100,000. The directors are John L. Beveridge of Colgrove, Cal.; W. Gordon Miller of Pittsburgh, Pa.; J. Clark Williams of Buffalo; E. R. Ware of Worcester, Mass., and S. J. Douglass of East Aurora.

The National Executive Committee.

A call has been issued by President T. P. Culloton of the National Association of Master Plumbers for the mid-year meeting of the National Executive Committee, to open January 25 at the National Headquarters in the Revere House, Chicago.

The committee is composed of Wm. H. Doyle, James Meathe, C. C. Dewstoe, Ed. Braden, Jr., M. J. Ward, John L. E. Firmin, John Hickman, James Ahern, Hubert Kelly, James J. Johnson and P. M. Murphy.

Any business requiring the attention of this committee should be promptly brought to the attention of some member of it or the president to be considered at this meeting.

Acetylene Gas Regulations.

The Board of Fire Commissioners of Jersey City, N.J., has adopted regulations for the manufacture and storage of acetylene gas. The regulations provide: "That the manufacture of carbide of calcium or the liquefaction of calcium carbide be prohibited except under certain prescribed limitations to be designated by the board. That it declines to permit the use of any acetylene gas regenerator in this city except those devices first submitted to the board for careful test, examination and approval of the board. That after the careful examination made into the methods of operation of the Bournonville gas regenerator, and finding the same to be operated on safe scientific principles, and in view of the small quantity of carbide treated by said device and the careful storage and distribution of the same, that the embargo laid by the board against the use of this machine be withdrawn and its operation sanctioned, provided that the methods now employed be not altered or made more dangerous.

"It is further provided that the use or storage of calcium carbide be confined to quantities of 5 pounds each, which must be stored in heavy block tin vessels, and until ready for use hermetically sealed, and that no dwelling, factory or other building be permitted to keep on storage a total quantity in excess of 25 pounds in cans or vessels of 5 pounds each.

"All parties desirous of storing in this city a quantity of calcium carbide or liquefied acetylene gas in excess of the limitations above defined to be allowed to do so only upon formal request to the board and special permission obtained therefrom."

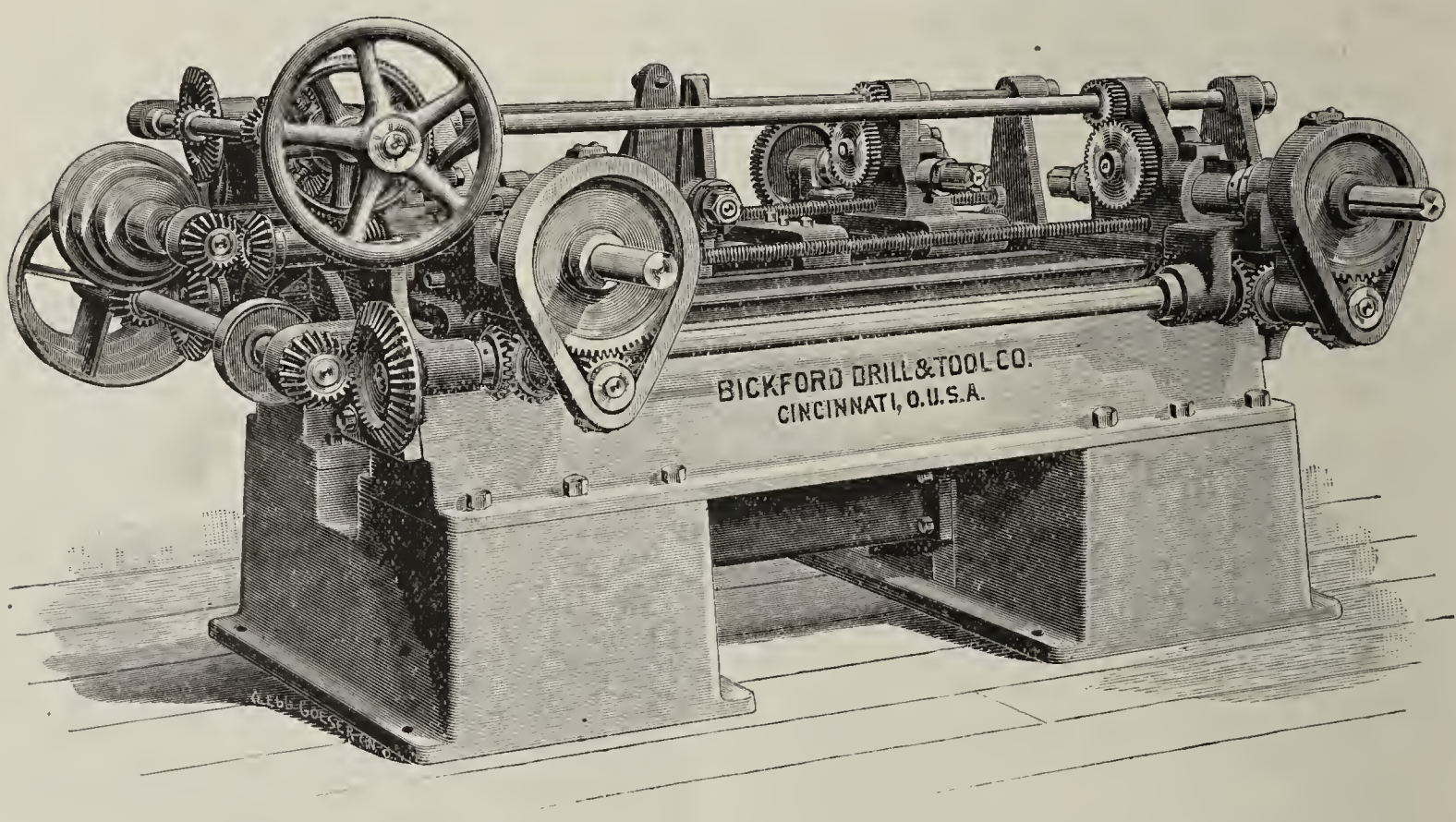
Of the 137 master plumbers who took the examination at Milwaukee, Wis., 75 passed and 58 failed. In announcing the result the Board of Commissioners gave the numbers that were on the papers of those who succeeded in passing the examination. In this way the names of those who were unsuccessful have not been disclosed to the public.

M. T. Hoey.

We regret to announce the death of M. T. Hoey, which occurred January 12. Mr. Hoey had represented the house of Thomas Hoey, 399-405 Atlantic avenue, Boston, Mass., for the past three years as traveling salesman among the towns of Eastern New England, and was well known and universally liked by all of the trade in the places he visited. His death was the indirect result of a serious operation performed the early part of October, but was immediately due to his devotion to business. He had recovered from the operation sufficiently to be about, but in a much weakened condition. Considering there were affairs in a neighboring city which needed his personal attention, and in spite of the protests of Mr. Hoey, he made the trip, thereby catching cold, which brought on pleurisy and resulted in his death.

Radiator and Boiler Drill and Boring Machine.

The accompanying cut illustrates a new four-spindle drilling and boring machine which the Bickford Drill & Tool Company, 530 East Front street, Cincinnati, Ohio, have just placed on the market. The tool is especially applicable for the drilling and boring of radiator and boiler sections, for which purpose it was designed, but its construction is such that it can be adapted to a much wider field of usefulness, and rearranged for a great many classes of work. It is entirely automatic in action and will bore four 5-inch holes through cast iron boiler sections 1½ inches thick in 2½ minutes. The bed is made in two parts, so that the work may be slid into position from the end of the machine. The hand wheel at the left furnishes a quick return movement to the spindles, all of which operate simultaneously. The heads are entirely independent of one another, and may be adjusted to any part of the bed, which is made in various lengths and is fitted with from 2 to 12 heads, according to the work for which the machine is intended. The following gives some of the dimensions of the machine as shown: Diameter of spindles, 2 7-16 inches; traverse of spindles, 6½ inches; length of machine, 9 feet 4 inches; width of machine, 7 feet 7 inches; diameter of driving cone, 18½, 15¾ and 13 inches; width of face of driving cone, 5¼ inches; minimum distance from center to center of spindles, 15 inches; maximum distance from center to center, 72 inches; weight of machine, about 8000 pounds.

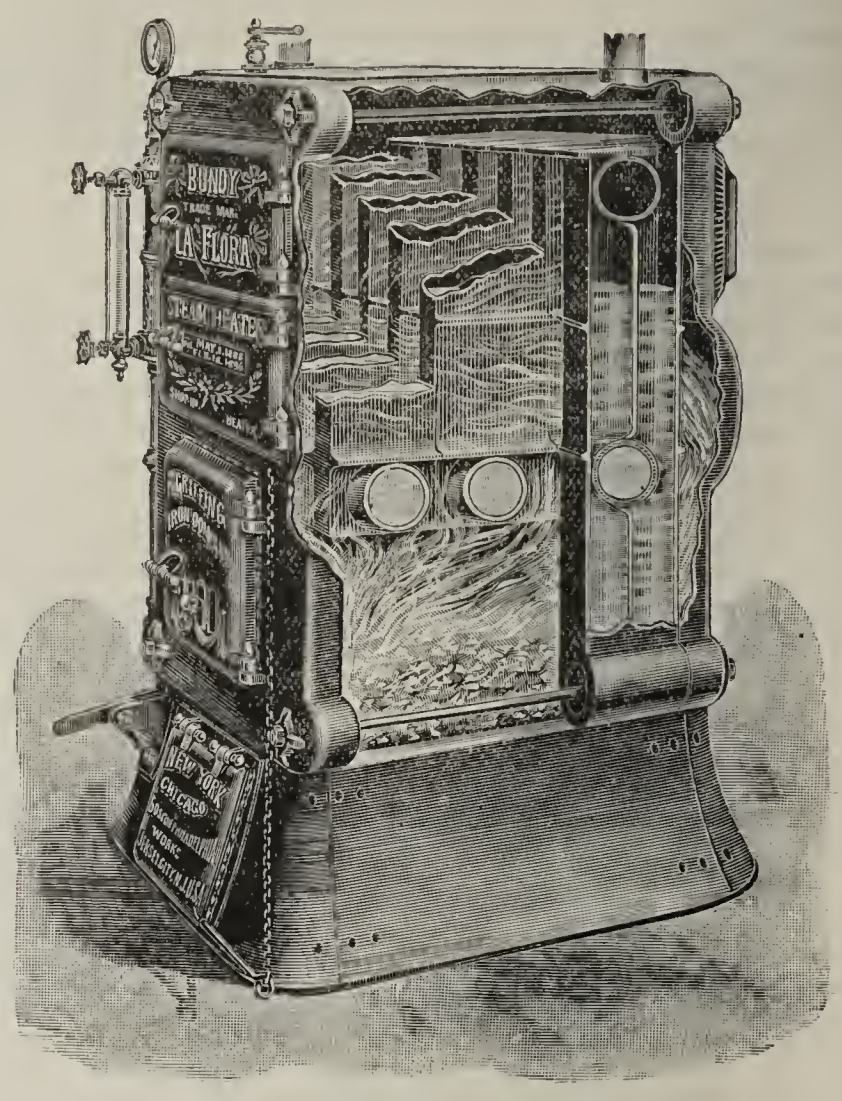


Radiator and Boiler Drill and Boring Machine

Frank J. McGlade, Doylestown, Pa., has finished the plumbing system and steam heating plant in the handsome new residence of Samuel Penrose. There are two bathrooms, floored and wainscoted with tile, fitted with enameled bathtubs and silver plated fittings. The kitchen and pantry are fitted up in the modern style. A No. 3 Mercer steam boiler is connected with a heating system, which includes both direct and indirect radiation.

Bundy La Flora Heater.

The Bundy La Flora heater, manufactured by the A. A. Griffing Iron Company, 66 68 Centre street, New York,



Bundy La Flora Heater.

with branch houses at Boston, Mass., and Philadelphia, Pa., and with works at Jersey City, N. J., is of sectional construction and of the return flue type. The fire first plays upon a large amount of crown sheet surface, as may be seen by the illustration herewith, that is irregular in contour and which has a retarding influence, so that as much heat may be absorbed by this direct flame touched fire surface as possible. The hot gases are then conducted twice the entire length of the heater through flues, entering the smoke pipe at the rear. There is a water section both front and rear, and the fire in turning into the first or lower tier of flues acts directly against a water backed surface by right angle impingement. This method will commend itself strongly to practical engineers as an

economical feature of great importance. The Bundy La Flora heater is made up of a series of sections that are of the full width of the heater. These sections are shipped by the manufacturer all put together ready for assembling side by side in such numbers as the size of heater requires. The component parts of the single sections are joined together by smooth nipples, iron to iron, and are carefully tested. The sections are also put together with smooth nipples, iron to iron. Around the smooth nipples and between the bosses are placed gaskets of special construction as a secondary precaution against leaks. It is claimed that all joints will be tight on the nipple, or on the gasket, but the use of the double precaution is commendable along the line of high grade production.

The main circulation in the Bundy La Flora heater is vertical, and by virtue of the liberal sized openings in all sections extending from the lowest part directly to the highest part of the heater the steam produced in any section takes the shortest route to the steam depository at the top, where the outlet pipes are connected. This, it is pointed out, procludes frictional circulation, which causes unsteady water line. The grate is of the rocking and dumping type, non warping and with lateral fingers around the socket to quicken and keep bright the marginal fire that acts upon the vertical fire pot surface at the sides and ends. The fire door opening is large to assist in coaling, so that an even distriution of the coal is made possible over the entire surface of the fire by the fire tools furnished with the heater. The fire door is lined to prevent warping and to secure a baffle plate, which in conjunction with the slide opening permits the admission of air into the gas burner chamber with, it is said, highly satisfactory results as viewed from the standpoint of minimum fuel consumption. The Bundy La Flora heater is made only for steam, its companion heater for hot water being the Bundy La Belle heater. The La Flora is made in seven different sizes, ranging in gross capacity from 300 square feet of direct radiation to 1400 square feet. As the cut shows it has no drums or headers and is very easy to set up. The front is of attractive design, and the heater is easily cleaned.

Missouri State Association of Master Plumbers.

The Missouri State Association of Master Plumbers was organized in St. Joseph, Mo., on the 10th inst. A number of representative plumbers from different parts of the State met at the Commercial Club house and took the initial steps in the movement that is expected to result in much benefit to the entire plumbing trade. The meeting was called to order by D. J. Collins of St. Louis, who is vice-president of the National Association of Master Plumbers. M. J. Ward was elected president, and in his address accepting the office he called attention to the prosperous associations of plumbers which are flourishing in nearly every State in the Union, and expressed the hope that Missouri would soon be in line with other States in this matter.

New Haven Plumbers and State Convention.

The eighth annual convention of the Connecticut State Association of Master Plumbers will be held in New Haven on February 16, under the auspices of the New Haven Master Plumbers' Association. At a recent meeting committees for the convention were appointed, as follows:

Chairman General Committee.—S. E. Dibble.

Finance.—Clinton E. Coe, chairman; T. W. Corbett, James M. English, J. Newton Pierpont.

Invitations.—Andrew J. Clerkin, chairman; W. A. T. Smith, T. L. Routh, Christian Herpich.

Printing and Badges.—William H. Hazel, chairman; A. B. Wilkinson, C. C. Bradley, Edward N. Botsford, Frank Rourke, A. H. Buckingham.

Banquet.—Theodore A. Potter, chairman; Robert Morgan, F. A. Curtiss, Robert Liddle, D. E. McNamara.

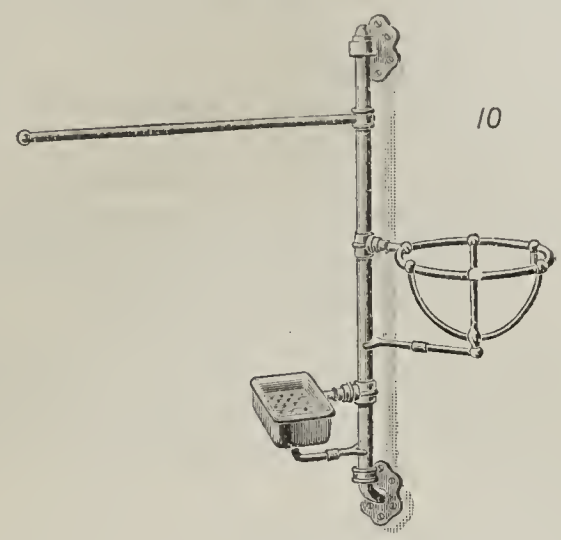
Reception.—Charles U. Neumann, chairman; William Keane, E. A. Rourke, Joseph Carr, J. E. Igo, J. A. Campbell, F. A. Carlton, W. T. Bristol, D. F. Kelly, A. B. Sproul, J. D. Eldridge, J. H Buckley, William H. McDonald, J. J. Sullivan, E. J. Ryan, L. F. Grady, T. R. Catton.

Refreshments.—D. M. Sheehan, chairman; H. H. Guernsey, J. B. Beegan, P. J. Donnelly, F. A. Campbell, A. Edmondson.

Music and Entertainment.—S. E. Dibble, George Edmondson, C. Elmer Dibble, W. M. Farrell, J. L. Clark.

Vanderman Toilet Fixtures.

The Vanderman Plumbing & Heating Company, Willimantic, Conn., who have brought out many interesting novelties, have applied for a patent for and are manufacturing the Vanderman system of toilet room fixtures and holders, illustrations of three combinations being shown herewith. The devices, it will be seen, consist of vertical rods upon which various combinations of fixtures can be fastened. It will be noted that they take up little space



The Vanderman Toilet Fixtures.—Fig. 1.—*Combination No.* 1.

are made so that they can be easily kept clean, and being adjustable on the handle either vertically or horizontally, they can be placed in the most convenient position. The brackets that hold the standard are provided with screws so that they can be readily attached or removed from the wall or wood work of any room. The numbers in the

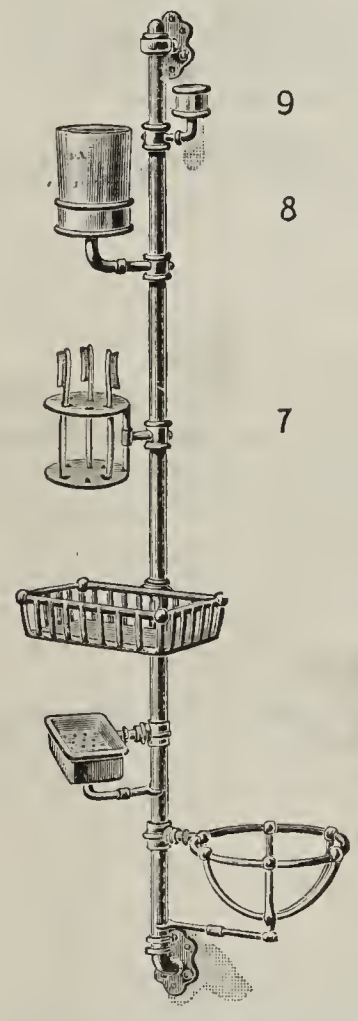


Fig 2.—*Combination No.* 2.

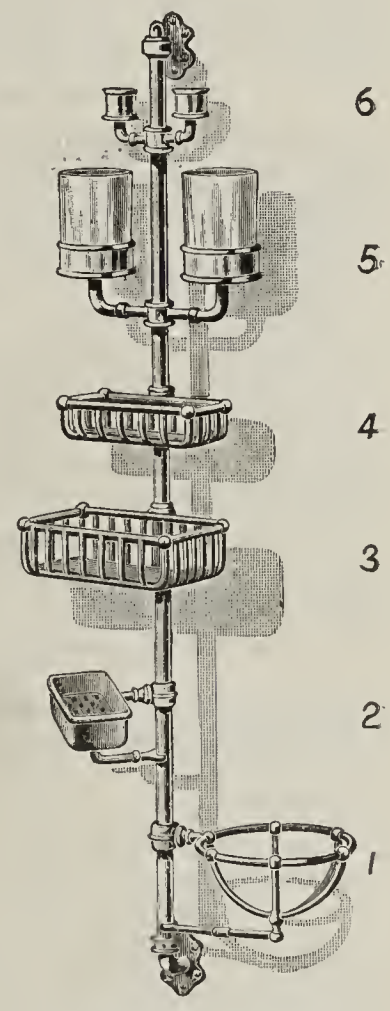


Fig 3 —*Combination No.* 3

cuts designate the different fixtures. No. 1 is a sponge holder; No. 2, soap cup; No. 3, brush holder; No. 4, comb holder; No. 5, tooth brush and tumbler holder; No. 6, match and burnt match holder; No. 7, tooth brush holder; No. 8, single tumbler holder; No. 9, match holder, and No. 10, towel holder. The fixtures are all nickel plated.

Duffey Brothers, 304 Stockton street, San Francisco, Cal., have recently completed the plumbing in the Spreckels Building in that city. They have made a specialty of fine plumbing work, and have done the plumbing in the Union Depot, the Berry Building, the Pacific Mutual Life Building, Doctor McNutt's Sanitarium, the Supreme Court Building and numerous other large and important buildings in the city. The firm make a display of handsome plumbing goods and carry a large stock.

ANNUAL MEETINGS.

NEW YORK MASTER PLUMBERS.

At the annual meeting of the Association of Master Plumbers of New York, held at their headquarters, 155 East Fifty-eighth street, January 4, the following officers were re elected to serve for the ensuing year:

President, Samuel L. Malcolm.
Vice President, Isaac J. Brown.
Recording Secretary, Andrew H. Brown.
Financial Secretary, John W. Cooney.
Treasurer, James O'Brien.
Sergeant-at Arms, Charles A. Walsh.
Marshal, William Kirchof.
Trustees, James Gilroy, John Mitchell, T. J. Cummins, Wm. Montgomery and Alexander Bryant. Wm. Lockwood will continue as the clerk of the association.

CINCINNATI MASTER PLUMBERS.

The annual meeting of the Master Plumbers' Association of Cincinnati, Ohio, was held in the Builders' Exchange, and there were two tickets in the field when the election of officers for the year was begun. The following were elected:

President, W. F. Wagner.
Vice-President, Wm. Lawson.
Secretary, W. M. Jenny.
Sergeant-at-Arms, Thomas D. Lynn.
Directors, Wm. Attlesey, Thomas J. Canary and Charles Homan. After the election of officers the delegates to the State Convention, which will be held at Dayton on February 16, 17, 18, were chosen, as follows: Delegates as officers of State Association, Wm. Attlesey and Ed. J. Nolan. As delegates, Wm. F. Wagner, Louis Krouse, Wm. H. Botley and Arthur McPhee. As alternates, Chas. Homan, George Stocker and A. J. Diehm

BINGHAMTON MASTER PLUMBERS.

At the annual meeting of the Master Plumbers' Association of Binghamton, N. Y., the following officers were elected for the ensuing year:

President, L. A. Galpin.
Vice-President, D. J. Malane.
Secretary, G. Cropper.
Treasurer, W. D. McCullaugh.

The association has appointed committees to arrange for the tenth annual convention of the New York State Association of Master Plumbers, to be held in Binghamton on March 1 and 2. The Committee on Halls consists of W. D. Scoville, T. A. Warner, J. S. Oftering and G. Cropper. The Committee on Hotels is made up of D. J. Malane, L. A. Galpin and G. Cropper.

INDIANAPOLIS MASTER PLUMBERS.

At the annual meeting of the Master Plumbers' Association of Indianapolis, Ind., held January 3 in the Builders' Exchange, the following officers were elected for the ensuing year:.

President, James M. Healy.
Vice-President, W. W. Wilcox.
Treasurer, George Kirkhoff.
Recording Secretary, Wm. Keopper.
Financial Secretary, Joseph Haslinger.

After the election the members discussed the new ordinance, which carries with it the appointment of a plumbing inspector with a salary of $1200 per year, who must stand an examination.

THE CHATTANOOGA MASTER PLUMBERS.

From Secretary Fred. Fox, Jr., we learn that at the annual meeting of the Chattanooga Master Plumbers' Association, held January 3, the following officers were re-elected to serve for the ensuing year:

President, R. O. Carlin.
Treasurer, H. A. McQuade.
Secretary, Fred. Fox, Jr.

The local organization is said to be perfect and all the supply houses in the vicinity of Chattanooga have not only signed the Baltimore resolutions but are living up to them.

HUDSON COUNTY, N. J., MASTER PLUMBERS.

The Master Plumbers' Association of Hudson County, N. J., at their annual meeting, Thursday evening, January 6, held at Groeschell Hall, Jersey City, elected the following officers for the ensuing year:

President, J. A. McDonald.
First Vice-President, T. H. Heatherton.
Second Vice-President, J. Donnelan.
Third Vice-President, T. Doran.
Recording Secretary, M. P. Moran.
Financial Secretary, J. A. Sprouls.
Corresponding Secretary, N. Waltherthum.
Treasurer, W. J. Cross.
Sergeant-at-Arms, J. Anderson.
Trustees: F. T. Kelleher, Thomas Cox and B. Keilt.

DETROIT MASTER PLUMBERS.

At the annual meeting of the Master Plumbers' Association of Detroit, Mich., held January 8, in the Builders' Exchange, the following officers were elected:

President, Samuel Dickson.
Vice-President, J. E. Lee.
Recording Secretary, S. H. Morgan.
Financial Secretary, John G. Kraemer.
Treasurer, Richard Walsh.

Delegates to the Convention of the Michigan State Association of Master Plumbers, to be held at Lansing in February: Guy Greeney, Samuel Graham, J. E. Lee, P. Steiner, Richard Walsh, Thomas Norris, James Cameron, Jr., S. H. Morgan, O. Helm, C. Childs, Samuel Dickson, James Meathe, James Crumley and James Partlan.

BROOKLYN MASTER PLUMBERS.

At the annual meeting of the Master Plumbers' Association of Brooklyn, N. Y., the following officers were elected for the ensuing year:

President, Thomas Kelly.
Vice President, Fred Schlüchtner.
Treasurer, Geo. W. Smyth.
Recording Secretary, D. Donegan.
Financial Secretary, J. W. Kelly.
Sergeant-at Arms, Walter Coyne.
Marshal, John Ebel.
Trustees: E. McDonald, H. Noble and M. F. Gleason.

New York Master Plumbers' Reception.

The ninth annual entertainment and reception of the Association of Master Plumbers of New York City was held on Thursday night at the Central Opera House, 306 East Sixty-seventh street, New York, and was a highly successful affair. A feature was the attendance of master plumbers from other cities. New Jersey was represented by National State Vice-President W. Zeliff of Newark, and Brooklyn, N. Y., by the new officers, Thomas Kelly, Fred. Schlüchtner, G. W. Smyth, D. Donegan, J. W. Kelly, Walter Coyne, John Ebel, Eugene Kelly, M. F. Gleason and E. McDonald.

Among those present from New York were: Samuel L. Malcolm, John Byrns, E. Burns, Alexander Bryant, H. J. Pattison, T. J. Tuomey, I. J. Brown, Wm. Kirchoff, A. H. Brown, B. F. Donahoe, George Brown, C. H. Kranichfelt, Wm. Brown, T. J. Cummins, T. J. McCormack, Wm. McCormack, J. W. O'Brien, John Yule, Charles Walsh, John Renehan, E. Mueller, Wm. Seelig, T. Clark, J. Muir, R. Donahoe, E. Collins, J. J. Flood, E. J. Brady, John Carey, James Tennant of the Health Department, and Wm. Lockwood, the clerk of the association.

The committee who provided the entertainment was T. J. Tuomey, J. W. O'Brien, J. W. Cooney, T. J. McCormack, B. F. Donahoe, T. F. Gaynor, A. H. Brown and H. J. Pattison. The hall was handsomely decorated with evergreens and palms. The evening opened with music by the orchestra and a fine variety entertainment, ending with an exhibition of views by the cinematographe. At the close of the entertainment the handsome costumes gave a coloring to the gathering, and after the grand march an elaborate programme of dances was begun.

The Entertainment Committee received many assurances that their efforts to please had been most successful.

Water Waste and Spring Faucets.

The Chicago authorities are determined to check the great waste of water known to be made in that city. An ordinance before the City Council provides that "any plumber who shall put in place any other than a spring faucet on any wash hand basin, sink or similar water fixture after the passage of this ordinance shall, as a penalty, be subject to having his license revoked at the discretion of the Commissioner of Public Works." It is further expected that after a certain time a regulation will be enforced requiring all ordinary faucets now in use to be replaced by spring or self closing faucets. The claim is made that many householders open their faucets in hot weather and let the water run for hours in the belief that they are thus cooling the atmosphere of their houses, and in extremely cold weather they do the same thing to prevent the water pipes from freezing.

Bargains in Plumbers' Supplies.

Two plumbing supply houses of the borough of Brooklyn, Greater New York, are amusing the trade and demoralizing prices by issuing from day to day bargain lists of plumbing goods at cut rates. Such a course is widely at variance with the efforts now being made by the wholesale houses and the plumbers to arrange for conferences to remedy the evils of the trade and settle their differences.

NOTES.

John Hunter, a well-known brass founder of Halifax, N. S., died recently at his residence on Birmingham street, at the age of 78 years.

Geo. Z. Winter, Southbridge, Mass., has just finished putting a Gurney Steam Boiler in the residence of John A. McKinstry. He has also contracts for installing Gurney Steam Boilers in the residences of Peter Peck and John M. Clemence.

The business of the Sanitary Company, Portland, Maine, has been purchased by E. P. Sargent, Jr.

Harry Dayton has purchased a hardware store at Burton, Ohio, and will move his stove and tin business from Orwell.

The Board of Health of Salem, Mass., for 1898 has organized with David M. Little, chairman. There being a vacancy in the Board of Examiners of Plumbing, Chairman Little will represent the board, thus making the Board of Examiners of Plumbing for 1898 consist of Alderman David M. Little, Inspector of Buildings John Pollock and Inspector of Plumbing L. E. Millea.

The Wolfe Warming & Ventilating Company, Boston, Mass., have the contract for warming and ventilating the new school at Auburn, Maine, and J. H. Chase has the plumbing contract.

The Board of Aldermen of Kansas City, Mo., have passed an ordinance to charge plumbers $1 for every permit issued and creating the offices of deputy plumbing inspector and plumbing inspector's clerk.

At a meeting of the Examining and Supervising Board of Plumbers and Plumbing, held in its room in the Municipal Building, Buffalo, N. Y., Tuesday, January 4. Charles B. Huck was unanimously chosen for chairman for the ensuing year. This is the third time his associates upon the board have chosen him for their presiding officer. Joseph Irr was elected to fill the position of secretary and treasurer, filled for the past three years by Samuel Wright. Dean Wilson was chosen as sergeant-at-arms, a new office created this year on account of the increase of business. G. W. Ratcliffe was appointed as clerk to the board.

J. J. Giseke has been appointed a member of the Board of Examining Plumbers of Cincinnati, Ohio.

The Board of Health of Bradford, Pa., has elected Dr. F. W. Winger president, and will ask the City Council to provide an inspector of plumbing.

The Adams Steam Heating & Supply Company, Helena, Mont., have been the largest contractors in their line employed in the construction of Fort Harrison, and now have contracts at the post, Townsend, Missoula and Boulder. The concern have put in most of the steam heating plants and general plumbing in the new buildings of the several State educational institutions.

A health ordinance has been passed at South Norwalk, Conn., requiring plumbers to register, to file plans of their work and to take out permits. It provides for an inspection of all plumbing work and for furnishing the house owner a certificate of the character of the work. It also provides for trap ventilation and a number of necessary precautions of a sanitary nature.

The J. A. Fitzel Company succeed A. J. Hicks at Morgantown, W. Va., and will do a heating, plumbing and roofing business, besides carrying a line of Stoves, Tinware and House Furnishing Goods. J. A. Fitzel of the new company was formerly in the employ of McClure & Co., Pittsburgh, Pa.

John I. Leitch of the New York office of the Standard Radiator Mfg. Company of Buffalo, N. Y., informs us that the arrangement existing between the Standard Radiator Mfg. Company of Buffalo and the St. Louis Radiator Mfg. Company of St. Louis, Mo., has been canceled, and that in future the Standard Radiator Mfg. Company of Buffalo will do business with the trade direct, and that they are the exclusive proprietors of the Standard radiation. It is also pointed out that the location of the plant in Buffalo, the "Electric City," for manufacturing and shipping is unrivaled. The capacity of the plant is said to be between 4,000,000 and 5,000,000 square feet of radiation, which is warranted in every respect for style, workmanship, price and prompt shipment. A new catalogue is soon to be issued giving full particulars in reference to their line.

J. D. Stewart, South Fork, Pa., has arranged with Prof. Paul M. Dysart of Pittsburgh, Pa., to manufacture the Acetylene Gas Regenerator invented by him. Mr. Stewart has installed lighting systems in the Baker and Crouse hotels, in the residences of Dr. J. H. Glass, W. L. Stineman, A. M. Stineman, and in his own store and workshop.

L. Emler has been granted a license as a plumber at Boulder, Col.

Elisha A. Loring has been appointed the Inspector of Buildings and Plumbing at Everett, Mass.

The firm of Bennett & Hammer, at Great Barrington, Mass., have been dissolved, and the plumbing and heating business will be conducted in the future by John Hammer under the firm name of Hammer Brothers.

The establishment of the Lucey Plumbing Company, North Adams, Mass., was recently visited by fire.

Frank McLain, who has been spending the holidays at Canton, Ohio, has returned to the New York office of the J. H. McLain Company, at 83 Centre street, and is prepared to push their line of Steam and Hot Water Heaters with renewed vigor.

A. T. Henderson of the New York office of the United States Heater Company is making a visit in Detroit.

Fred. D. Johnson of Fred. D. Johnson & Co., 83 Centre street, New York, spent the early part of the week at Buffalo visiting the International Radiator Mfg. Company.

Secretary Henry B. Gombers of the National Association of Master Steam and Hot Water Fitters states that 42 new members have been taken into the association since the last convention, and the list in accord has also shown a gratifying increase in number.

A new ordinance at Buffalo, N. Y., provides that only licensed plumbers will be allowed by the Bureau of Water to connect with the water service.

The manufacturers of brass goods will hold their quarterly meeting at Buffalo February 12. A feature of the meeting will be an effort to secure a different classification from freight carriers on the products of brass foundries.

The Examining and Supervising Board of Plumbers of Poughkeepsie, N. Y., organized on January 8 in the office of the Inspector of Plumbing, Owen Cook. Peter Adriance was elected president and Elmer E. Easthead secretary.

Frank Uhler and Jules Zimmerman of the Henry McShane Mfg. Company, Baltimore, Md., were in New York this week, and were at the entertainment of the New York Master Plumbers Thursday night.

Henry S. Downe, who is manager of the London branch of the American Radiator Company, is now in Chicago, consulting with President Bond and other officials on the future policy of the company relative to foreign trade. After a long period of persistent work, and patient application to the removal of various impediments, encouraging results are being shown. Mr. Downe will return to his post about February 1.

At a meeting of the Board of Plumbing Examiners of Hudson, N. Y., J. Frank Kertz was elected president and James H. Pultz was elected secretary. Those present at the meeting were J. Frank Kertz, Byron Parker, C. A. Parker, John Fuller and John P. Ganley.

The Toledo Master Plumbers' Association will send to the convention of the Ohio State Association of Master

Plumbers, to be held at Dayton on February 16, 17 and 18, eight delegates. They are State President W. G. Wacker, State Secretary Ed. Gruber, State Executive Committeeman Robert Raitz and five delegates from the local association, John Schultz, Thos. Manion, Wm. Gerken, J. C. Meissner and Harry Teal.

Brown & Ward, Oneonta, N. Y., have secured a $2000 contract for plumbing the State Armory at that place.

Walter A. Delory, Swampscott, Mass., is having a new building erected for his plumbing business.

A. Weiskittel & Son, Baltimore, Md., will soon commence the erection of a new foundry at Bayview, about a mile from their present location in Baltimore. The new building will be 150 feet wide by 500 feet long, and will be used principally for the manufacture of iron Bathtubs. They have for some time been making Bathtubs in their stove foundry, but feeling the want of larger quarters they decided upon building a structure of a size commensurate with the necessities of the business. They are supplying the Tubs both painted and enameled, and their productions are well spoken of among the trade.

The Vanderman Plumbing & Heating Company of Willimantic, Conn., have contracted to put in the hot water heating apparatus in the new Walden Apartment Building at Hartford.

E. J. Winslow & Co., Bennington, Vt., have been awarded the contract for putting the steam heat and plumbing in the new passenger station of the Bennington & Rutland Road. The cost will be $1000.

McClellan Universal Brace.

The S. McClellan Universal Brace Company, for whom John H. Graham & Co., 113 Chambers street, New York, are manufacturers' agents, are introducing the McClellan

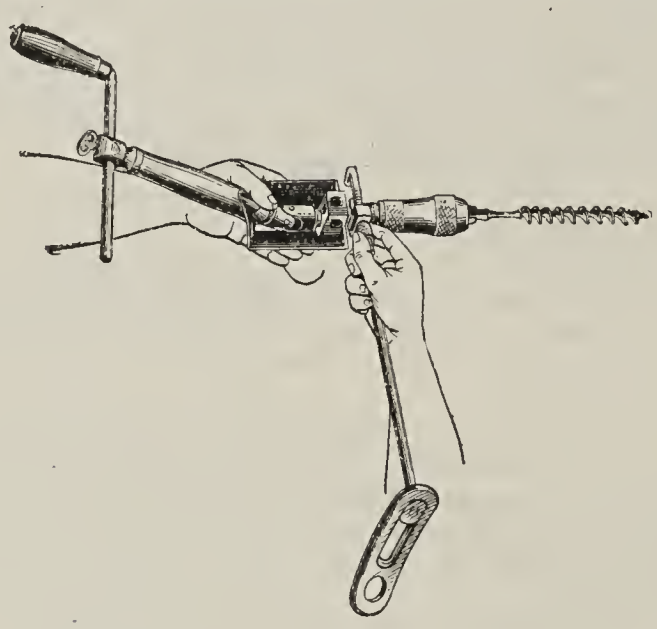


Fig. 1.—Assembling Breast Rest in One of Five Positions.

guide frame combination angle and breast brace shown in the accompanying engravings. This brace is designed to operate where it would be difficult or impossible to bore with other tools, being especially valuable, we are told, in telephone, telegraph and general electrical construction, and for car building, plumbing and carpenter work, and particularly useful for corner boring. The point is made by the company that holes can be bored in an exceedingly close space, absolutely in line with point of rest of the angle, and without wobbling. The various parts can be readily taken apart and put together. The breast rest is detachable, Fig. 1 showing it about to be attached

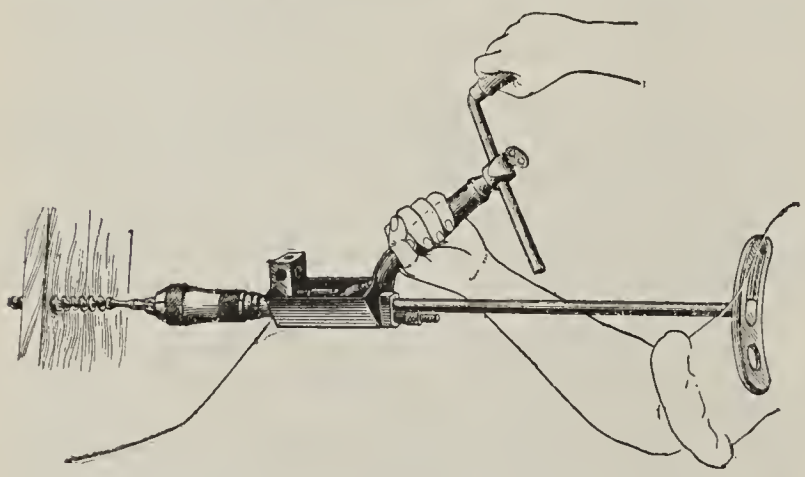


Fig. 2.—Method of Using as an Ordinary Breast Brace.

to one of the four holes at the base of the chuck. Fig. 2 shows another position for attaching the breast rest, in line with the bit instead of at right angles. The arm piece of breast rest can be moved and held rigidly from center to edge as desired. The handle can be adjusted to have a sweep of from 4 to 13 inches by moving the bar, which is held by a thumb screw. The center section

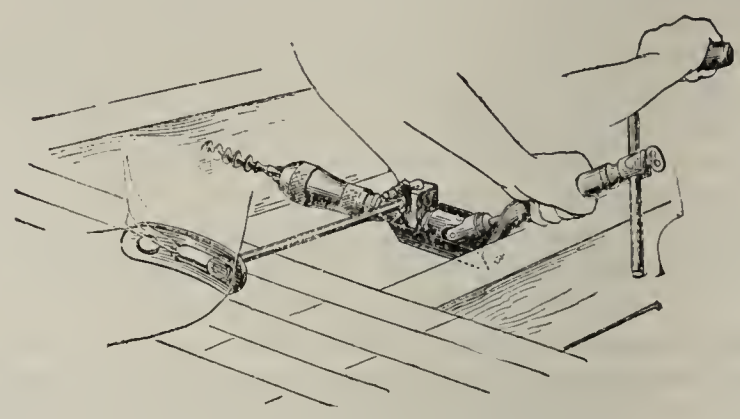


Fig 3.—Boring Between Joists in Floor.

holding the ball and socket joint is of cast metal, with two flat sides underneath, at right angles with each other, valuable as a rest in close corner boring. The handle is hardwood and the tool can be furnished in nickel plate or japan finish. Fig. 1 indicates how the breast rest is placed in one of the several positions possible. Fig. 2 shows the tool used as an ordinary breast brace. Fig. 3 illustrates the method available for boring between joists in the floor. Fig. 4 represents the brace

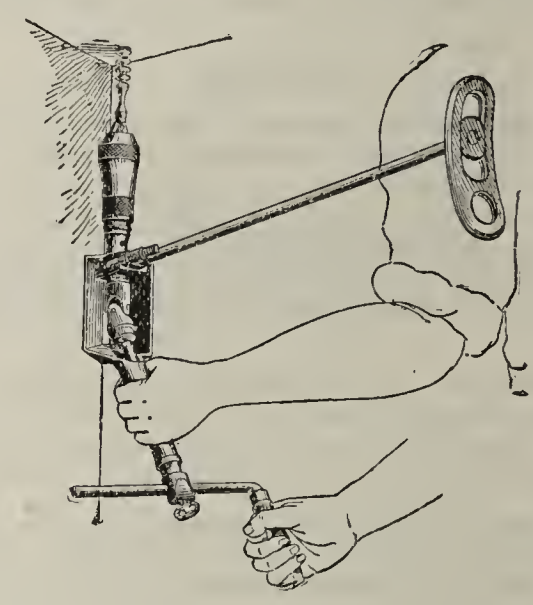


Fig. 4.—Boring Overhead, in Corner, or Between Upper Ceiling Joists.

used overhead, in corner, or between upper ceiling joists. Fig. 5 illustrates a modification of the brace described above, made for such work as is usually done by bellhangers, electricians, telephone and pattern makers, and for light carriage work. It will bore a hole up to ½ inch in any corner against the ceiling, between joists, under floor, in counters, or any place where a ratchet brace is

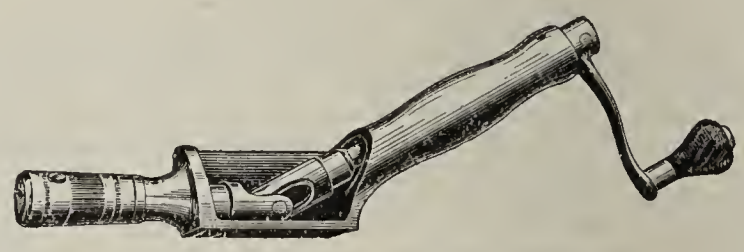


Fig. 5.—Small McClellan Universal Brace.

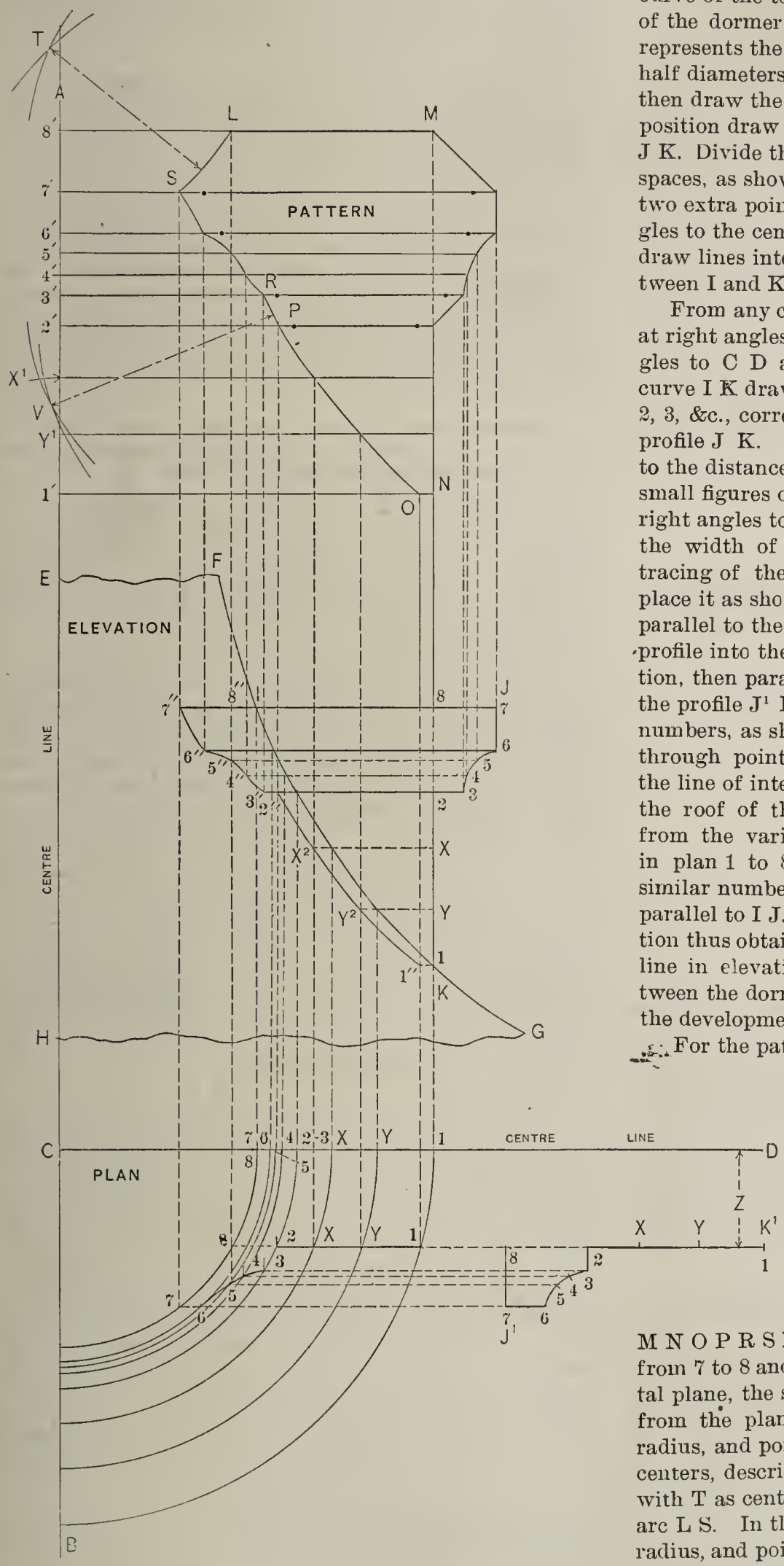
required. It is light, can be carried in the coat pocket, and is sold for much less than the brace described above.

A company under the title of the St. Petersburg Company for the Transmission of Power from Waterfalls have recently been organized at St. Petersburg, Russia, to put down plants for the utilization of the Narowa, Imatra and Wuozen waterfalls in the generation of electrical power, and to transmit to and distribute the same in St. Petersburg and surrounding districts for electric lighting and power purposes. The capital of the company is said to be $2,000,000. The purchases of both machinery and supplies will begin early in April.

SHEET METAL WORK.

PATTERN FOR MOLDINGS MITERING AGAINST CONCAVE CONICAL TOWER.

A subscriber in *The Metal Worker* asks us to tell him how to cut the pattern for the moldings on the sides of a



Pattern for Moldings Mitering Against Concave Conical Tower.

dormer window mitering against a concave conical tower, shown in the accompanying illustration, in which E F G H represents a partial elevation of the tower, and I J K the side of the dormer window which is to miter against the tower. In this connection it may be proper to remark that it is not necessary when obtaining the pattern to draw a full elevation of the tower ; all that is required being the center line of the tower and as much of the curve of the tower as will be necessary to receive the side of the dormer. Draw any vertical line, as A B, which represents the center line, let E F and H G represent the half diameters of the tower at these points respectively, then draw the desired curve or sweep F G. In its proper position draw the profile or side of dormer indicated by J K. Divide the curved portion of the profile into equal spaces, as shown by the small figures 1 to 8, introducing two extra points, X and Y, as shown. Now at right angles to the center line A B and through the various points draw lines intersecting the curve of the tower F G between I and K.

From any convenient point, as C on the center line, and at right angles to A B, draw the line C D. At right angles to C D and from the various intersections on the curve I K draw lines intersecting C D at points 1, Y, X, 2, 3, &c., corresponding to lines of similar numbers in the profile J K. Now with C as center, and with radii equal to the distances from C to the various points shown by the small figures on the line C D, draw arcs as shown. At right angles to the center line C D in plan set off half the width of the dormer window, as at Z. Now take a tracing of the side of the dormer J K in elevation and place it as shown by J^1 K^1 in plan, placing the line 1 2 parallel to the center line in plan, as shown. Space the profile into the same number of parts as shown in elevation, then parallel to C D and from the various points in the profile J^1 K^1 draw lines intersecting arcs of similar numbers, as shown by points 1 to 8 in plan. A line traced through points of intersections thus obtained will show the line of intersection between the side of the dormer and the roof of the tower. Now at right angles to C D and from the various points of intersection in the miter line in plan 1 to 8 draw lines upward intersecting lines of similar numbers in elevation drawn from the profile J K parallel to I J. A line traced through points of intersection thus obtained, as shown from 1′ to 8′, will be the miter line in elevation, showing the joint or intersection between the dormer side and tower, but is not necessary in the development of the pattern.

For the pattern proceed as follows : Upon the center line A B place the stretchout of the molding 8 J K, as shown by the small figures on A B. At right angles to A B and through the small figures draw lines intersecting those of similar numbers drawn from the miter line in plan or elevation parallel to A B, also from the various points in the profile J K in elevation. Trace lines through points of intersections thus obtained; then will M N O P R S L be the pattern required. As the distances from 7 to 8 and 2 to 3 in profile in elevation lie in a horizontal plane, the shape of that part in the pattern is obtained from the plan, as follows : With C 7 or C 8 in plan as radius, and points S and L on lines 7′ and 8′ in pattern as centers, describe arcs intersecting each other at T. Then with T as center, and using the same radius, describe the arc L S. In the same manner, with C 2 or C 3 in plan as radius, and points R and P on the lines 2′ and 3′ in pattern as centers, describe arcs intersecting each other at V ; then with V as center, using the same radius, describe the arc R P.

The completion of the Spreckels Building, at San Francisco, Cal., has called forth considerable admiration for

the work of the California Artistic Metal & Wire Company, who furnished the iron grills around the elevators, which are said to be excellent examples of old German wrought iron work. All the iron window frames, metal doors, stairways and metal work in the building were supplied by this firm, who also furnished the ceilings.

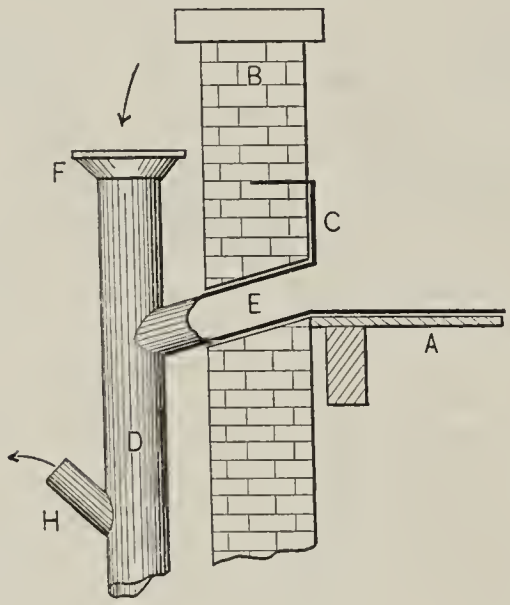
National Iron Roofing Manufacturers' Association.

The annual meeting of the National Iron Roofing Manufacturers' Association will be held in Cincinnati, Ohio, Wednesday, January 19, at the Grand Hotel. We understand from Secretary George M. Verity that, judging from the responses received, there will be a very large attendance.

Thawing Frozen Leaders.

BY W. N.

A difficulty often experienced in the winter is keeping the leaders clear of ice. Where the gutter is connected direct to the leaders it is an easy matter to clear the ice in the pipes by means of rock salt and hot water, but where a tube passes through the wall or other parts of a building and an elbow is the result, it can be accomplished as follows: Referring to the accompanying sketch, let A represent the roof, B the parapet wall and C the flashing connecting with the tube E, thence to the leader D. The pipe extends upward to allow it to be easily reached from over the wall and has a flaring collar, as shown at F. A small offshoot, H, can, if desired, be placed



Thawing Frozen Leaders

at every window having access to the leader. Assuming that the leader has been frozen, rock salt is placed at the tube E and into the pipe at F, while if convenient hot water is also poured into it, which will gradually work its way through. By having the offshoot H at every window, if so situated, hot water and salt can also be placed in them. Should, however, the ice melt on the roof and the water flow into the tube E when the pipe is not open all the way down the water can overflow at H, and will not back up on the roof nor flow under the flashing C.

The Peck, Stow & Wilcox Company,

Southington, Conn., and New York City, have just issued what they call the centennial edition of their catalogue of tinsmiths' tools and machines. They explain the name of the catalogue by saying that nearly 100 years ago such articles were first made for general use, and the Peck, Stow & Wilcox Company succeed the various individuals and firms who as pioneers laid the foundation of their present extensive business. The volume contains 144 pages and most of the pages contain several illustrations of different tools. The first goods noted are folding machines, then come grooving machines, wiring, setting down, burring and turning machines in various styles. Beading machines follow, then double seaming machines, wire straighteners and wire feed and cutters. In this connection they call attention to the wire reel which they are now offering to the trade, this being so made that it can be used in a vertical or horizontal position and the arms adjusted to any length, so that it can receive ordinary coils of wire or smaller coils if desired. Forming machines of various types follow; then corrugating machines, tube formers, folding machines and gutter machines. Squaring shears occupy nearly 20 pages, while rotary shears are likewise illustrated in various styles. Hand tools come next, and a full assortment of tinners' stakes, swedges and hammers, roofing tongs and cornice brakes are next shown. At the end are lists of machine parts and miscellaneous tinners' tools.

FLASHINGS.

The Globe Ventilator Company, Troy, N. Y., report a constantly increasing business, and refer to several large orders recently booked, among them being three 40-inch copper ventilators for the Henry McCaddin Memorial Building in Brooklyn and two 60-inch ventilators for the High School at Tarrytown, N. Y.

We are indebted to the Ornamental Stamping Works, Grand Rapids, Mich., for a copy of their elaborate catalogue of Architectural Sheet Metal Work, Ornaments, Statuary, Steel Ceilings and Spun Goods. The volume, of oblong shape, measures 12 x 9 inches and is bound in colored paper with front and back covers decorated in gilt. The firm of H. Leonard & Sons have taken an interest in this business, and the factory is now well prepared to fill orders promptly, and they call special attention to their facilities for the execution of special designs. The volume opens with Ornaments of endless variety, covering over 40 pages. Then various Capitals are shown, followed by Moldings, Friezing, Belts, &c. The next department is Sheet Metal Statuary, which includes a variety of figures. The rest of the book is given up to Ornaments and Ceiling Designs, Rosettes, &c.

The Birmingham Paint & Roofing Company, Birmingham, Ala., are putting up a large plant for the manufacture of Iron Roofing materials of all kinds.

The Chamberlain Metal Weather Strip Company of Detroit, Mich., have been incorporated, with a capital of $5000, by Charles Breden, Hugh E. Kenney and others.

John W. Burry, president of the Cambridge Iron & Steel Company, Cambridge, Ohio, with E. E. Winckler of 136 Liberty street, New York, recently paid a visit to the trade in Philadelphia.

William Connors, 669-675 River street, proprietor of the Troy Paint & Color Works, Troy, N. Y., is favoring his friends in the trade with a very pretty calendar for the new year in the shape of a poster lithographed in colors. The upper half of the poster carries a *fac simile* of the trade-mark of American Seal Paint, the general design being national in character, as it shows Uncle Sam and Miss Columbia in the foreground, with a view of the Capitol at Washington in the distance. There are also various cans of Ready Mixed Paints, Varnish, Roofing Cement, Mortar Color, &c., scattered about the foreground, and as Uncle Sam holds a pallette and brushes in his hand it is evident he has been demonstrating the practical merits of some of the goods advertised. The leaves carrying the calendar proper are of a light greenish hue, the printing being in bold faced white letters and figures. Underneath the leaves is a list of the varied lines of Paints and Cements which Mr. Connors is prepared to furnish. He states that samples and prices will be sent free on application.

The Iron City Mfg. Company, successors to A. Northrop & Co, and which, as noted in our last issue, was purchased by John C. Graff of the Graff Roofing Company of Pittsburgh, Pa., who will reorganize the business under the name of the Iron City Mfg. Company, Mr Graff being president, send us a copy of their Catalogue G. This is a pamphlet of 52 pages giving full information about the Sheet Metal Ceilings, Roofings, Siding and Moldings, both plain and ornamental, made by the above concern. The earlier pages present illustrations of Friezes, Borders, Coves, &c., these being followed by panel designs and coverings, sectional and detail illustrations showing the method of applying the metal. An interesting part of the pamphlet is taken up with illustrations of various ceiling designs, showing many handsome combinations that can be made with the different styles and their application to all sorts of buildings. As an indication of the popularity of the work done by this concern it may be mentioned that the list of references alone covers six closely printed pages, these being exclusive of the testimonial letters. At the close are given instructions for putting on Northrop Patent Sheet Iron Roofing.

The firm of Mager, Ritter & Co., doing business in Stoves, Tinware and Cornice Work at 113 South Seventh street, Allentown, Pa., were recently dissolved by mutual consent, Thomas E. Ritter retiring. The business will be conducted by Daniel Mager under the name of the Allentown Cornice Works.

TIN PLATES.

GOVERNMENT REPORT OF TIN PLATE PRODUCTION.

Col. Ira Ayer, Special Agent of the Treasury Department, has completed his annual report on the production of tin and terne plates in the United States covering the fiscal year ended June 30, 1897. This report is the last that will be issued under Government auspices, as it completes the six years of probation marked out for the American tin plate industry under the terms of the McKinley act. It shows a remarkable advance in the production of American tin plate over the previous fiscal year, amounting to over 45 per cent., while the net imports of foreign plates fell off in the same period about 60 per cent. Colonel Ayer's report is in part as follows :

During the fiscal year ended June 30, 1897, the production in the United States of commercial tin and terne plates was 446,982,063 pounds, against 307,226,621 pounds produced during the previous fiscal year, showing thereby an increased production of more than 45 per cent. Of the production for the year, 446,924,855 pounds, or practically the entire output, was made from sheets rolled in the United States.

The production for the year, distributed according to kind and weight of plates, was as follows:

Product.	Lighter than 63 pounds per 100 square feet. Pounds.	63 pounds per 100 square feet and heavier. Pounds.	Total. Pounds.
Tin plates	307,965,826	47,381,844	355,347,670
Terne plates	84,131,032	7,503,361	91,634,393
Total	392,096,858	54,885,205	446,982,063

These figures show that about 88 per cent. of the production belonged to the class of plates weighing lighter than 63 pounds per 100 square feet, the proportion being slightly larger than that for the previous fiscal year, which was more than 86 per cent. The report embraces the production of 50 firms, or three less than that for the fiscal year ended June 30, 1896.

The following comparison shows the records of previous fiscal years:

Production of Tin and Terne Plate.

Fiscal year.	From American black plate.	Per cent. American black plate.	From foreign black plate.	Per cent. foreign black plate.	Total.
1891-1892	9,296,553	68.12	4,350,166	31.88	13,646,719
1892-1893	43,599,724	43.68	56,219,478	56.32	99,819,202
1893-1894	85,968,202	61.74	53,255,265	38.26	139,223,467
1894-1895	160,576,934	82.85	33,224,139	17.15	193,801,073
1895-1896	303,002,098	98.62	4,226,523	1.38	307,228,621
1896-1897	446,924,855	99.99	57,208	0.01	446,982,063

American Sheet Iron and Steel.

The quantity of American sheet iron and steel made by stamping and other manufacturing firms into articles and wares tinned or terne plated, stated by quarters, was:

Quarter ended—	Pounds.
September 30, 1896	1,289,332
December 31, 1896	2,520,943
March 31, 1897	2,723,651
June 30, 1897	2,388,135
Total	8,922,061

The quantity of American sheet iron and steel used in this class of manufactures during the fiscal year ended June 30, 1896, was 10,586,110 pounds.

Black Plate Production.

The production of black plates in the United States during the fiscal year, stated by quarters, was as shown below:

Period. Quarter ended—	Lighter than 63 pounds per 100 square feet. Pounds.	63 pounds per 100 square feet and heavier. Pounds.	Total. Pounds.
September 30, 1896	80,747,945	10,291,444	91,039,389
December 31, 1896	78,064,218	14,684,201	92,748,419
March 31, 1897	99,059,357	16,001,642	115,060,999
June 30, 1897	119,716,892	17,872,336	137,589,228
Totals	377,588,412	58,849,623	436,438,035
Total production fiscal year ended June 30, 1897			436,438,035
Total production fiscal year ended June 30, 1896			334,014,798
The difference is			102,423,237

Showing an increased production of more than 30 per cent.

The production of such plates lighter than 63 pounds per 100 square feet is 86.5 per cent., as compared with 77 per cent. during the preceding year.

Thirty-six rolling mills were producing black plates during the fiscal year ended June 30, 1897, the number being the same as during the previous fiscal year.

Consumption of American Plates.

Of the 50 firms reported as producing commercial tin and terne plates, only one used foreign made plates during a portion of one quarter, the amount being 57,208 pounds, out of a total production by the firm for that quarter of 213,687 pounds.

Of the 53 firms reported as producing commercial tin and terne plates during the fiscal year ended June 30, 1896, 50 used wholly American rolled sheets and three used both American and foreign, with an aggregate output of 15,503,154 pounds. Of this amount, 4,226,523 pounds, or about 27 per cent. of the output, was made from foreign rolled sheets.

Imports and Exports.

The quantity of tin plates and terne plates imported into the United States and entered for consumption during the fiscal year ended June 30, 1897, stated by quarters, was as shown below:

Quarter ended—	Lighter than 63 pounds per 100 square feet. Pounds.	63 pounds per 100 square feet and heavier. Pounds.	Total. Pounds.
September 30, 1896	77,027,181	1,527,595	78,554,776
December 31, 1896	46,014,920	1,259,915	47,274,835
March 31, 1897	60,672.974	802,702	61,475,676
June 30, 1897	56,605,371	496,943	57,102,314
Totals	240,320,446	4,087,155	244,407,601

The quantity of tin plates and terne plates on which duties were paid, and which were used in the manufacture of articles exported with benefit of drawback, during the same period, stated by quarters, was:

Quarter ended—	Lighter than 63 pounds per 100 square feet. Pounds.	63 pounds per 100 square feet and heavier. Pounds.	Total. Pounds.
September 30, 1896	38,954,434	125,376	39,079,810
December 31, 1896	32,905,773	63,394	32,969,167
March 31, 1897	32,998,461	19,625	33,018,026
June 30, 1897	34,156,207	22,920	34,179,127
Totals	139,014,815	231,315	139,246,130

The foregoing figures show:

Comparison of Production and Net Imports.

	Pounds.
Total imports during fiscal year ended June 30, 1897	244,407,601
Total exports same period	139,246,130
Net imports	105,161,471
Total domestic production	446,982,063
Approximate consumption in United States	552,143,534
Average annual capacity of mills completed June 30, 1897, say	600,000,000
Same of mills completed and in process of construction June 30, 1897, say	650,000,000

The figures for the previous fiscal year were as follows:

	Pounds.
Total imports during fiscal year ended June 30, 1896	385,070,372
Total exports, same period	137,659,779
Net imports	247,410,593
Total domestic production	307,228,621
Approximate consumption in the United States	554,639,214
Average annual capacity of mills completed June 30, 1896 (180), say	560,000,000
Same of mills completed and in process of construction June 30, 1896 (188), say	585,000,000

Recovery of Tin from Scrap.

Numerous patents have been taken out from time to time to utilize tin plate scrap, based on processes for separating the tin from the iron or steel. The tin is either rubbed off mechanically, heated, treated chemically by dissolving in caustic soda with the addition of oxidizing agents, or dissolved in acids and separated afterward. Finally there are several electrolytic methods for the recovery of the tin. None of these methods seems to pre-

vent large amounts of tin plate scrap going to waste. Dr. A. Harpf, in *Stahl und Eisen*, proposes to utilize the material in the lead smelter in place of the scrap iron now added. The tin, melting first, would be acted upon by the sulphide of lead, finally coming down in a tin-lead-antimony alloy, which has its uses direct in the arts. Care would have to be taken to keep out all galvanized iron, for zinc would take away the silver, and is a nuisance anyhow.

Dealers' Special Brands.

We are advised by Chas. A. Conklin Mfg. Company, Atlanta, Ga., that the following brands of American terne plates, owned by them, should have been included in *The Metal Worker* List of Dealers' Special Brands printed in our issue of January 1, 1898:

Conklin's Old Style.
Dixie Old Process.
Elmo.
Glen.
Ivy.
Lenox Redipped.
Piedmont.

SCRAP.

Work is progressing rapidly on the new Tin Plate plant of the Laughlin Nail Company, Martin's Ferry, Ohio, notwithstanding unfavorable weather for building operations. The structural iron portion of the new building is nearly all in place, and it is expected that the new plant will be ready for work about March 1.

A strong side light is thrown on the results achieved by the American Tin Plate industry in the annual statement presented to the stockholders of the E. P. Breckinridge Can Company of Toledo, Ohio. It was not very long ago that the company in question, who operate one of the largest factories in the country devoted to the production of Tin Cans and other Tinware, found it necessary to import all of their raw material. Last year they used 65,000 boxes of American made Tin Plate, and not a single box of the British product was received. Moreover, the company were able to buy the American Plate at about $1 a box less than that of foreign manufacture. The advantage gained in this instance by the establishment of the domestic Tin Plate industry is obvious.

The latest issue of *Griffiths' List* shows that at the end of 1897 15 Tin Plate works in South Wales and Monmouthshire were idle or for sale. These works possess an aggregate of 101 mills. Among them are such well-known plants as the Worcester, Port Talbot, Pontypool, Machen, Pontymister, Lion, Abertillery, Gwendraeth, Burry and Ashburnham works, many of which are never likely to run again.

The *Industrial World* of Swansea, Wales, in summing up the result of last year's struggles to maintain the 1874 wage list, is forced to admit that "since the present union was established the close of a year has not seen Tin Plates in such a plight as they are in at present."

The Tin Plate mills have been heavy buyers of Billets and Tin Plate Bars since the opening of the year. It is reported that the orders from Pennsylvania and Indiana mills alone have footed up to about 75,000 tons.

The Wells & Nellegar Company, 72 to 76 Lake street, Chicago, are increasing their facilities by securing lofts in adjoining buildings. They will then be enabled to carry larger stocks of Hardware and make more prompt shipments to supply their rapidly increasing trade.

Marshall Brothers & Co., Philadelphia, have ordered a No. 2 Mesta Pickling Machine from the Leechburg Foundry & Machine Company, Pittsburgh, Pa.

A press dispatch from Pittsburgh, Pa., of January 13, states that a meeting of Tin Plate manufacturers will be held in that city on Tuesday next to receive and consider the report of the special committee appointed at the meeting of the manufacturers at Columbus, Ohio, the week before last.

A press dispatch from Easton, Pa., reports that F. M. Hower, one of the best known slate operators in Pennsylvania, has sold his slate land of 62 acres, quarry, buildings and entire manufacturing plant at Danielsville to the Hower Slate Company, organized under the laws of West Virginia. The president is Edwin T. Rice, Jr., of New York, and the secretary and manager, Charles A. Morrison of Easton. The capital is all English, and the real buyers are represented by F. C. Davis and A. Hilt of London. It is understood Mr. Hower will receive about $200,000 for the plant.

Railroad Building in 1897.

Reports received by the *Railroad Gazette* up to the time of going to press indicate that the building of new railroads in 1897 was a little less than for the year before and a few miles more than the total reported for 1895, though still far short of that in 1890 and earlier years. Official reports from the various companies show a total mileage built during the year, not including second track and sidings, of 1604.17 miles. To this must be added 223.75 miles, which the news columns of the *Railroad Gazette* show to be completed by the close of the year, giving us 1827.92 miles, pretty accurately verified. There are a number of roads on which it is known that grading has been completed and track laying is in progress. The exact amount of track laying, however, it is impossible, at this time, to state, but it is estimated to be not less than 110 miles. This makes the total probable railroad building during 1897, 1937.92 miles, of which all but 333.75 miles is official. Of course, reports from roads not yet heard from will somewhat modify these results. We give below the official and estimated mileage by States, omitting, however, the 110 miles, which has probably been completed, but of which we have no definite record:

NEW RAILROAD BUILDING IN 1897.

States.	Official.	Estimated.	States.	Official.	Estimated.
Alabama	114	.....	Missouri	61.7	31.5
Arkansas	84.5	.....	Montana	13.9	.....
California	169.06	23	New Jersey	10	.....
Colorado	35.33	.....	New York	27.02	.....
Delaware	.....	25	North Carolina	47.38	5
District Columbia	2	.....	North Dakota	36.29	.....
Florida	1	.....	Ohio	.28	5
Georgia	73.45	24	Oklahoma Terr	27	.....
Idaho	21	.....	Oregon	31	.....
Illinois	105.85	11	Pennsylvania	142.09	.....
Indian Ter	.8	.....	South Carolina	10.5	.....
Iowa	.....	8	Tennessee	15	.....
Kansas	1.73	.....	Texas	80.95	16.5
Kentucky	8.35	12	Vermont	.....	3.25
Louisiana	129.5	.....	Virginia	19.65	.....
Maine	19.35	.....	West Virginia	51.5	.....
Massachusetts	5.26	.....	Wisconsin	62.8	28
Michigan	98.71	27			
Minnesota	38.32	4.5	Totals	1604.17	223.75
Mississippi	55.9	.....			

The 110 miles of probable new road, not included in the above, is distributed as follows: Arkansas, 12 miles; California, 18; Georgia, 36; North Carolina, 10; Ohio, 10; Oklahoma Territory, 11; Tennessee, 12, and West Virginia, 8 miles.

It is interesting to make comparisons with previous years. According to "Poor's Manual," which appears about six months after the close of the calendar year, and is therefore in position to gather up practically all the construction of the year, the new building for 1896 was 1996.72 miles, or about 59 miles more than the total estimate here given for 1897. In 1895, which is the low water mark in railroad construction, the mileage was 1922.25. Poor puts the new construction in 1894 at 2263.97 miles, in 1893 at 2789.02 miles, in 1892 at 4584.01 miles, in 1891 at 4620.41 miles and in 1890 at 5656.7 miles.

TRADE NOTES.

Among recent incorporations is that of the American Brass & Copper Company of New York City, N. Y., with $50,000 capital. W. E. Hawkins, F. T. Mercer and W. H. Platt are the directors named.

The Coale Brass Mfg. Company of Baltimore, Md., have been incorporated, with a capital of $15,000, by J. M. Coale, F. W. Coale and W. J. O'Brien.

The Detroit Copper & Brass Rolling Mill Company, Detroit, Mich., have contracted for the erection of a large addition to their present plant.

The Ohio Brass & Iron Mfg. Company, Cleveland, Ohio, will erect a new building at a cost of $7000.

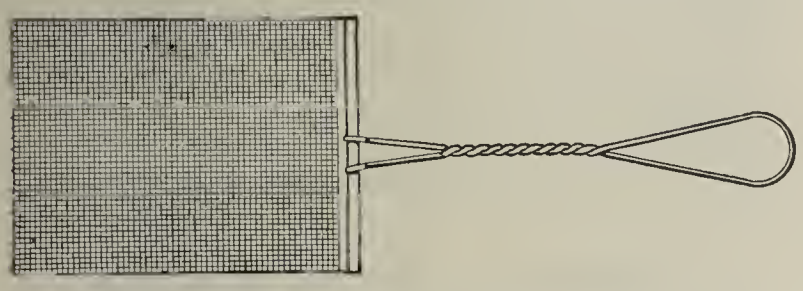
A charter has been issued to the Asbestos Mfg. Company of Philadelphia, Pa., with a capital of $20,000. The incorporators are: W. Harris Seitzer, Alvin M. Ehret, Harry S. Ehret, Michael Ehret, Alonzo Gibbons.

The latest cable advices from London state that there are signs that the end of the great strike in the engineering trades of Great Britain is approaching. Large numbers of Glasgow engineers have applied for reinstatement, and a meeting of the engineers of Fairfield decided to continue work, in spite of their previous threats to strike when the first 25 per cent. of their number were locked out.

THE RETAIL STORE.

The Champion Fly Killer.

We show in the accompanying illustration the Champion fly killer, made by Henry E. Dean & Co., 180 Austin street, Worcester, Mass., makers of kitchen goods and



The Champion Fly Killer.

wire specialties. The manufacturers point out that this fly killer is light to handle, is not readily broken, is very effective and does its work in a clean manner.

Bolt or Rivet Cutters.

The Peck, Stow & Wilcox Company, 27 Murray street, New York, are manufacturing two bolt or rivet clippers, as here shown. Fig. 1 is their No. 21 Lindsay's compound lever bolt cutter, forged, with polished steel jaws, and is said to cut rods ⅜ inch in diameter. Fig. 2 represents Nott's No. 23 compound lever bolt cutter, with detachable and interchangeable cutters, powerful enough to cut ½-inch bolts. Both tools are 27 inches long, and they are provided with buffers to prevent damage to the cutters when the bolt is cut through.

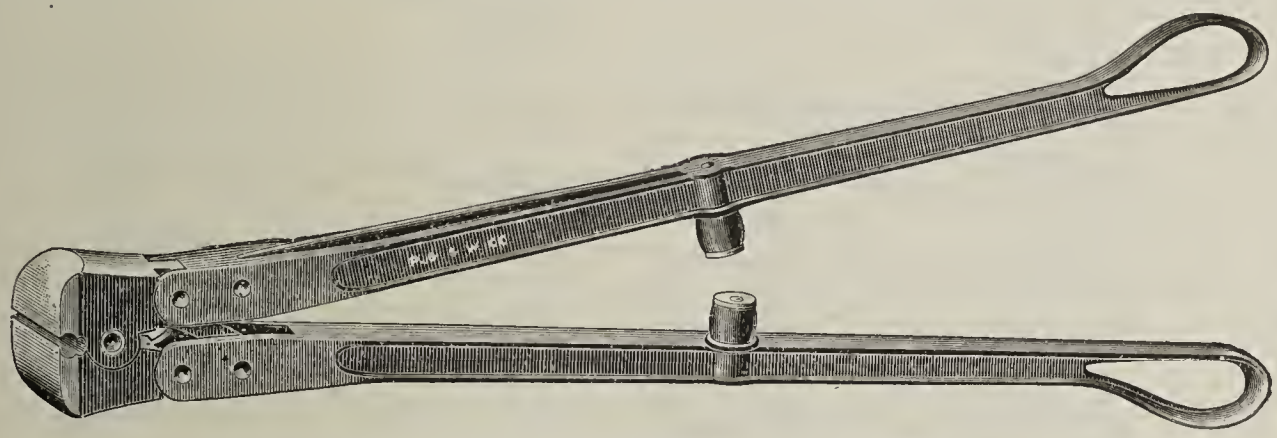


Fig. 1.—Lindsay's Compound Lever Bolt Cutter.

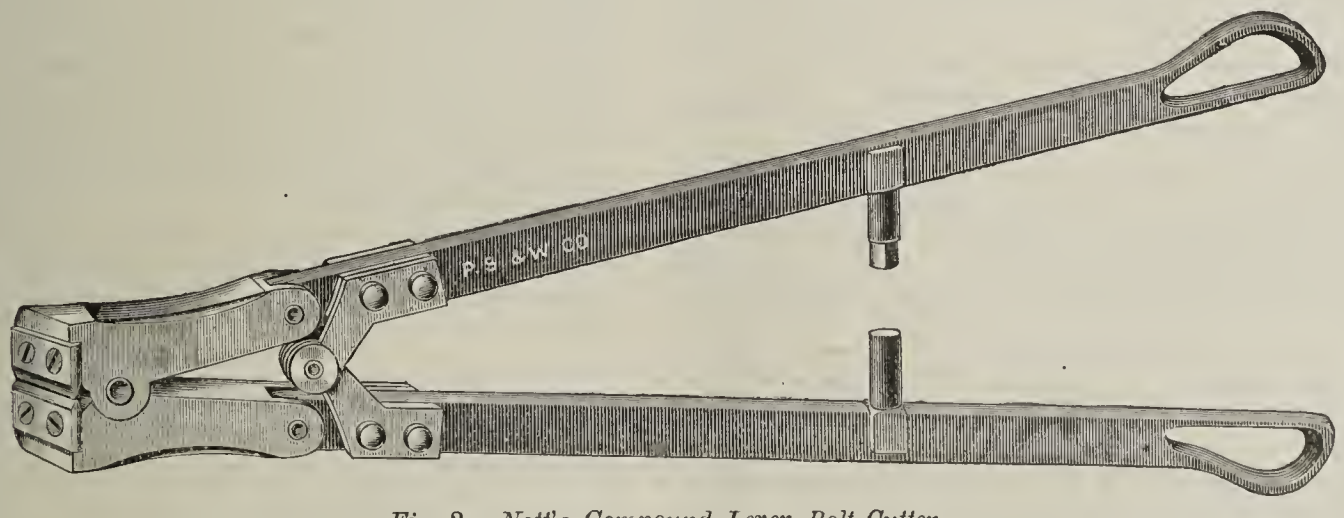
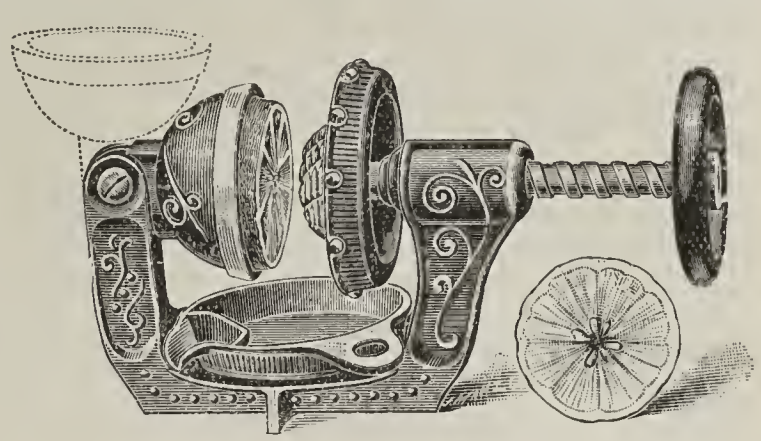


Fig. 2.—Nott's Compound Lever Bolt Cutter.

Lemon Squeezer and Cork Puller.

H. H. Beaumont, 203-205 Grand avenue, Milwaukee, Wis., Wm. H. Jacobus, Eastern agent, 90 Chambers street, New York, is the manufacturer of the Album lemon squeezer, here illustrated. It is designed for pressing lemons, beef, onions, fruit, &c. The dimensions are about 7½ x 4 x 5 inches, the solid removable aluminum saucer being 3 inches in diameter. The pitch of the composition screw insures a rapid action and it is run through babbitted metal. The device is supplied with a detachable plate for attaching to wall or wainscoting, so that the squeezer can be instantly lifted out and carried about for



Album Lemon or Fruit Squeezer.

use. If a quantity of any juice is required the cup can be tilted by raising the back on a ridge provided, so that as the liquid accumulates it can empty itself into another receptacle, the strainer in the cup keeping back any seeds or pulp which may escape in the operation. It is recommended by the manufacturer for use in families, hotels, clubs, restaurants, drug stores, hospitals, saloons, &c.

L. W. Seabolt of Winston, N. C., sole agent for Garland Stoves and Ranges, utilizes the local papers for some rather novel announcements. In one of these, which appeared not long since, he states that "the tide has turned from Klondike to the State of Matrimony, which is one of the United States." To those who are taking a trip to this interesting state it is suggested that the principal road leads via 112 West Fourteenth street, Winston, N. C., which, of course, is Mr. Seabolt's establishment, where the necessary outfit of House Furnishing Goods can be secured. He also intimates that the climate will be sultry as the tropics of housekeeping are passed unless a Garland Stove is purchased, which, as he put it, "will keep all hands as cool as cucumbers."

Minnesota Retail Hardware Association.

At a meeting of the Executive Committee of the Minnesota Retail Hardware Association, held in St. Paul, January 4, it was decided to hold the next annual meeting in Minneapolis, February 9 and 10. The following members of the committee were present at the meeting: C. F. Ladner, St. Cloud, president; James E. O'Brien, Crookston ; Clement Schroeder, Mankato ; M. R. O'Neill, Graceville ; E. A. Moye, Duluth ; W. H. Tomlinson, Le Sueur ; C. F. Stremel, Minneapolis. The work of the past three months was reviewed and the result proved very gratifying to the committee. During this time 125 dealers became members of the association, making it as large as any, if not actually the largest, Hardware association of retailers in the country. Among the persons who are affiliated with the association are many of the largest dealers in the State, men of influence and financial responsibility. The members of the association are now fully assured of the success of their movement for the protection of the trade. It was decided to extend a cordial invitation to all retail Hardware dealers in the States of Minnesota, Wisconsin, Iowa, North Dakota, South Dakota and Nebraska to meet with them and participate in their next annual meeting as above. At this meeting the trade conditions, the evils thereof and the remedies therefor will be taken up through papers read by the members, to be followed by a general discussion. As these questions are of vital importance to the dealers, much profit must result to those who attend.

The Executive Committee also considered the question of organizing a Northwestern association, and adopted the following resolution :

Resolved, That it is the sense of this committee that at our next annual meeting a committee of three be appointed to meet like committees to be appointed by the Wisconsin and North Dakota Associations to consider the advisability of organizing a Northwestern Association of Retail Hardware dealers, and to formulate by-laws and resolutions to govern the same That this committee be subject to the call of the president of the Minnesota Retail Hardware Association.

We are advised that arrangements have been made for reduced railroad rates, and that a fare and a third will cover the round trip. Further particulars can be obtained by addressing the secretary of the association, J. W. Clark, 901 New York Life Building, St. Paul.

Call for a Hardware Association in Pennsylvania.

The following letter from a well-known Hardware merchant will be read with interest by many Hardwaremen in Pennsylvania who are doubtless familiar with the troubles with which business is contending and the abuses which it is hoped may be in a greater or less degree corrected by concerted action. The letter of Mr. Fredericks is the result of consultation with other prominent merchants, and Hardware merchants in all parts of the State are requested to communicate with him without further notice. The movement is to be heartily commended, and we trust it will receive the active co operation of the trade :

To the Retail Hardware Dealers in Pennsylvania:

Believing the time has arrived when there should be an Association of the Retail Hardware Dealers in this State, I take this opportunity of inviting correspondence on the subject, expressing views as to the best location for a meeting and the time to call the same.

There are evils connected with the retail Hardware business that can be very materially corrected by a complete organization or association of this kind.

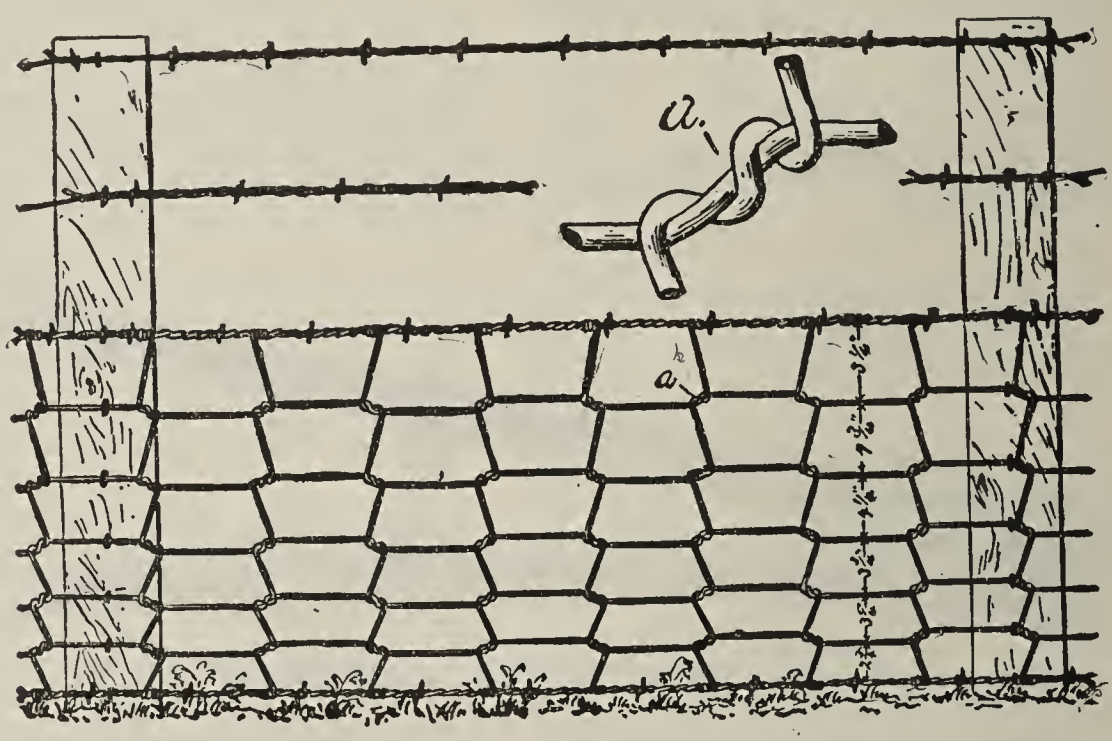
Let us get together and exchange views on this subject.

Address your communication to

J. H. FREDERICKS,
120 East Main Street, Lock Haven, Pa.

Warmer's Combination Wire Fence.

Combination Wire Fence Company, 5 East Levee, Kansas City, Mo., are manufacturing Warmer's combination fence, herewith illustrated. The distinctive feature of this commodity is the barbed top and bottom wire and that it is made of continuous wire by a special process of weaving. Fig. A in the cut is an enlarged detail showing the form of twist. The strong stay wires top and bottom are said to make sagging, bending or swinging over impossible, keeping cattle and hogs securely where they are put. We are advised the fence is made of the best galvanized steel wire, No. 12½. The fence is variously made with stays 10, 8 and 6 inches apart in hights as follows: 15, 20, 26, 32, 38, 48 and 52 inches. Fencing with stays 6 inches apart is put up in 15-rod rolls, the two other kinds in 20-rod rolls. The company refer to the fence 26 inches high with 10-inch stays as their standard size.



Warmer's Combination Wire Fence.

Hagan & Schad, 249-251 Second street, Marietta, Ohio, issue a neat little greeting announcing the beginning of their seventh business year as dealers in Hardware, Cutlery, Tinware, Stoves and Bicycle Goods. It is in pamphlet form, there being 24 pages, 5½ x 7 inches in size, and printed in a tint of brown ink. On the first page is a view of their store, showing "The place where Hagan & Schad, the live Hardwaremen, do business." After two pages of greeting to the public, headed by an illustration of an owl grasping a bludgeon in one claw, emblematic of knock down wisdom, come sundry pages illustrating and describing various specialties, some of which are priced. Toward the end is a page headed "This is our force." Then follow the names of the firm and employees grouped variously under the headings Store, Bicycle Shop, Gas Fitting Shop, Tin Shop, Office, and Drayman. The last page gives the location of the fire boxes in the six wards of the city.

MEMORANDA.

The Simmons Hardware Company, Incorporated, St. Louis, Mo., do not propose to let all the Klondike trade go to the Pacific Coast, and with a view to capturing some of it they have issued Circular 290, devoted particularly to Klondike outfits. These show Hardware, Campers' Supplies, Clothing, Belts, &c., while on the back of the poster is a map of the Klondike, information about the different routes and a list of necessary supplies and of things to eat and to wear.

The illustrated catalogue for 1898 issued by the Lisk Mfg. Company, Limited, Canandaigua, N. Y.. is a volume of convenient size containing over 70 pages and bound in heavy red paper with front cover decorated in silvered design. A general view of the works at Canandaigua serves as a frontispiece to the catalogue, after which the various goods made by them are illustrated, beginning with Pails of various sizes and shapes. Pans, Kettles, Boilers, Coffee and Tea Pots, Measures, Cups, Oil Cans, Bathtubs and Toilet Sets are some of the other goods noted in this catalogue.

D. G. & D. H. Donaldson, dealers in Stove Repairs, Buffalo, N. Y., have purchased the property at 50 South Division street, that city, where they will soon put up a brick business block for their own use. The lot is 22 x 77 feet.

An enterprising shopkeeper, says the *Pottery Gazette*, London, has hit upon a novel notion by which to draw attention to his window of Fancy Goods. In a conspicuous position he placed a large white card, whereon was inscribed, in flaming red letters, the following luring legend: "I have placed in my window a dozen articles actually marked below cost price. Any person selecting these articles may have them at the price stated." This unique offer naturally resulted in a good deal of speculation on the part of the bargain seeking public and led to a marked increase of trade.

The Stove and Tinware establishment of P. H. Von Blon of Upper Sandusky, Ohio, was recently damaged by fire, but the loss was fully covered by insurance.

In the death, which occurred last week, of Jacob Pfau, Sr., the well-known Stove dealer, Cincinnati loses one of its oldest and most respected citizens. He went with his parents to Cincinnati when only seven years old, and lived there 61 years with the exception of four years when he was in California during the excitement incident to the discovery of gold in that State. He started in the Stove business in Cincinnati 32 years ago, and about the same time was married to Miss Mary Smith, who with three children survive him. The funeral services were held from his late residence, 415 Chestnut street, on Wednesday of last week. There was a large attendance of the older and prominent citizens, including a delegation from the German Pioneer Society, of which Mr. Pfau was one of the first members.

William Gray, formerly connected with the Boynton Furnace Company of New York City, has recently been taken into the firm of Whitcomb & Kirkham, Stove dealers, at 140 State street, Springfield, Mass. The business will be conducted under the style of Whitcomb, Kirkham & Gray.

The Hill-Whitney Aluminum Company, Boston, Mass., issue a neat catalogue and price list of 22 pages calling attention to the high grade cooking utensils made from special hard aluminum. In an introductory note they state that their metal is an improvement on the pure metal which retains all the essential properties, but has a high tensile strength and is entirely free from poison. The special advantages of aluminum for cooking utensils are alluded to. The first part of the catalogue is devoted to utensils made from sheet metal, including Saucepans, Pudding Pans, Kettles, Boilers, Coffee Pots, Fry Pans, Pie Plates, Measures, Cuspidors, Pitchers, Chafing Dishes, &c. In cast aluminum the goods noted include Ladles, Broilers, Fry Pans, Tea Kettles and Steam Cookers. There are also a few cast iron and sheet iron utensils referred to in the catalogue. All the goods are illustrated and prices given.

The firm of Genesy & Savage, composed of F. C. Savage and B. J. Genesy, are opening a new store at Reno, Nev., where they intend to carry a full line of Plumbers' and Tinners' Goods and Supplies, also Stoves, Kitchen Furniture, &c. They would like to receive catalogues from manufacturers of all goods in the lines which they deal in.

James M. Horton, of the late firm of Horton, Gilmore, McWilliams & Co., Chicago, is now with Hibbard, Spencer, Bartlett & Co. and thus continues his connection with the Hardware trade. Mr. Horton has been deeply touched and at the same time gratified by the warm expressions of sympathy and regard received from many of his old customers, whose acquaintance dates back to the days of William Blair & Co. Mr. Horton's friends in the trade will find him occupying a desk in the general office of Hibbard, Spencer, Bartlett & Co., and they will be greeted with his habitual genial welcome, which has not been altered in the least by recent untoward circumstances.

Hibbard, Spencer, Bartlett & Co., Chicago, in addition to their great stores at Lake street and Wabash avenue, have for years maintained a capacious six-story warehouse a few blocks north, in which heavy or bulky goods are stocked. They have recently found it desirable to add more storage space and have secured a building adjoining their warehouse, which is fully as large. The stock of all kinds of Hardware carried by this house is so large that the two stocks carried by John Alling & Co. and Horton, Gilmore, McWilliams & Co. were easily absorbed. The additional warehouse facilities were not provided on this account, but by way of preparation for the immense increase in business which is expected this year as a result of the generally prosperous condition of the country.

J. T. Mercer & Co. have opened up a new store in Blunt, S. Dak. Shelf Hardware, Stoves, Implements, Tinware, &c., are carried.

E. T. Matthews has succeeded to the business of the Higbee Hardware Company, Bloomfield, Iowa. The stock comprises Shelf and Heavy Hardware, Stoves, Implements and Tinware.

Martin & Dixon have succeeded Wilcox Bros., Geneva, Ill., in the retail Hardware, Stove, Tinware, &c., business. Martin & Dixon were formerly located in Canton, S. D.

Graff Bros., Pittsburgh, Pa., will occupy, about April their new three-story brick building, 26 by 130 feet, with a complete line of Hardware, Tools, Paints, Oils, Glass, Stoves, Furnaces and House Furnishing Goods. The basement will be used as a wareroom, the first floor being entirely devoted to storeroom. The second and third floors will be used for Sheet Metal and Cornice Work.

The Grand Rapids Furniture Company, Grand Rapids, Mich., have recently organized a new department of their business. They will hereafter manufacture a complete line of carpet sweepers, making all kinds and sizes. This new department will be in charge of E. H. Taylor, formerly sales manager of the Goshen Sweeper Company, at Grand Rapids. Greenough, Desmond & Raleigh will represent them in the East. A more detailed statement of the company's intentions will be issued as soon as their arrangements have been fully completed.

Dillingham Mfg. Company, Sheboygan, Mich., have lately issued a new catalogue of New Iceberg hardwood refrigerators. The outer case of these refrigerators is made of kiln dried ash, with the parts so joined as to make a perfectly tight cabinet. The inner case is made of odorless lumber covered with Bird's patent water proof sheathing, claimed not to absorb moisture, shrink or swell. The inside is lined entirely with zinc. A dead air space is secured which is not filled with any substance. The favorable reports received from customers and the growing demand for these refrigerators are alluded to as demonstrating the satisfactory principle of the construction adopted. Air ducts secure circulation of cold air through the provision chamber. The styles shown comprise a wide variety of sizes and finish, including plain and sideboard constructions, single and double doors, low refrigerators, ice chests, grocers' sizes, beer coolers, &c.

W. J. Henry & Co. have opened up in business in Valparaiso, Ind. They are carrying a stock comprising Shelf Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c.

F. J. Baldwin has recently opened up in the Hardware and Stove business in Burlington, Kan. Mr. Baldwin will be pleased to receive catalogues and other printed matter from wholesalers and manufacturers in his line.

The Reeves Iron Company, Canal Dover, Ohio, for whom W. C. Brown, Northern Office Building, 36 La Salle street, Chicago, is Western sales agent, have recently begun to manufacture Galvanized Sheets made of Puddled Iron. They will continue the manufacture of Steel Galvanized Sheets, but believe that many Sheet Metal workers desire to be able to get Iron Sheets for special purposes, and are therefore ready to supply that special trade. Each Iron Sheet will be stamped with a die and guaranteed to be made of Puddled Iron. The price will be a little higher than that quoted on Steel Sheets, as the cost of production will be greater.

Graduation exercises and an exhibition of the work of the students in the Baron de Hirsch Trade Schools were held on the evening of Saturday, January 8, in the school buildings, 225 and 227 East Ninth street, New York City

STOVE TRADE NOTES.

TRAVELING SALESMEN FOR 1898.

Monarch Stove & Mfg. Company.—In addition to the list of salesmen and agencies already announced in connection with the Monarch Stove & Mfg. Company of Mansfield, Ohio, B. F. Blymyer, successor to H. R. Hamilton, 67 Lake street, Chicago, Ill., is the agent for the Monarch goods in the States of Indiana, Illinois and Northern Iowa; George Haw & Co., Ottumwa, Iowa, will have control of the Monarch goods for Southern Iowa and Northern Missouri, and Roberts, Parry & Co., Utica, N. Y., for the territory tributary to that city. At all these points stocks will be carried for the prompt shipment of orders.

Eugene Munsell & Co., 218 Water street, New York City, will be represented by the following salesmen, who will look after their goods in the territory indicated: C. William Dettermusch will travel in New York State and Western Massachusetts; Rufus Van Valkenburgh in New Jersey and Connecticut; C. W. Yasinski in the Greater New York; G. W. Elliott in Eastern Massachusetts and Rhode Island; E. C. Wood in Delaware and Eastern Pennsylvania; Charles E. Coleman in Western territory; and August Krieg will look after the architects' and builders' trade in Greater New York.

Syracuse Stove Company of Syracuse, N. Y., have made arrangements with the following travelers to represent their goods: George N. Pickstock will cover Eastern Ohio, Western New York and Northern Pennsylvania; Rufus Daggett will cover Northern New York, Central New York and Northern Pennsylvania; and Charles A. Grey will cover Vermont, New Hampshire, Eastern New York and Eastern Pennsylvania. Their New York City office will be continued at 105 Beekman street.

The Thomas White Stove Company, Quincy, Ill., will have their interests looked after during 1898 in the territory indicated by the following salesmen: Henry Wilson in Missouri, Kansas, Oklahoma and Indian Territory; M. Kirtley in Illinois and Missouri; J. H. McAfee in Iowa and Missouri; C. W. Shinn in Iowa, Minnesota, Wisconsin and South Dakota; and W. H. Wood in Missouri, Kansas and Nebraska.

The Richmond Stove Company, with works at Norwich, Conn., have arranged with B. E. Mallory to take orders for stoves, ranges and boilers, and with F. A. Leland he will visit the trade in the interest of the company's ranges and boilers. D. W. Clark, formerly of the Model Heating Company, will take care of their boiler and furnace trade. All these salesmen will make Norwich their headquarters. The company's New York office, at 85 Centre street, will be managed by C. F. Hauss, who has been with them so long. From this point will travel Thomas C. Fleming, formerly with the Griffing Iron Company, who will look after the trade in New York and suburbs in connection with Mr. Hauss. The trade in Brooklyn and vicinity will be looked after by J. S. McGee, while Western New York and Pennsylvania will be covered by W. J. Kennedy, who will make the New York office his headquarters. The company have all the men they require just at present, but they may decide later on to add to the above two or more men.

J. Elwood Yeager, Philadelphia, will be represented this year in Western Pennsylvania by W. G. Withers, who has just started out on an eight weeks' trip through that territory. H. F. Tyson takes the New Jersey territory, and will start out on the 17th inst. Mr. Yeager is sales agent for the New Era blue flame oil stoves made by the Yeager-Hunter Spring City Stove Works, Spring City, Pa., under license from the United Blue Flame Oil Stove Company.

Rathbone, Sard & Co.'s Chicago Office.

Rathbone, Sard & Co., manufacturers of Acorn stoves and ranges, will make an important change in their Western business arrangements in April. Hitherto their main Western office has been located in Chicago, while their stove works are at Aurora, Ill., 40 miles distant. When the Aurora works were started, eight years since, this arrangement was quite satisfactory, as fully half their shipments of stoves to Western customers were made from their Eastern works, at Albany, N. Y. But with the flight of years important changes have occurred. The capacity of the Aurora plant has been increased and its facilities improved so that it wholly supplies their Western trade. The inconvenience of having the office 40 miles from the works was a comparatively small matter under the conditions prevailing a few years since, but now it has grown to be a serious matter, involving delays and all sorts of petty annoyances, notwithstanding modern methods of quick communication. In April, therefore, the clerical force now employed in Chicago will be removed to Aurora, including the manager, Edmond Raftery. The vice-president, Wm. H. Sard, will retain his residence in Chicago, and a branch office and sample room will be maintained at the present location, Wabash avenue and Randolph street, for the convenience of the large city business which the company enjoy. The concentration of the business and manufacturing departments at Aurora will enable business thereafter to be handled much more expeditiously, and, doubtless, much more satisfactorily to the trade.

Jewel Security Trade-Mark.

An illustration is herewith given of the new trade-mark designed by George M. Clark & Co., 72 to 76 Lake



Jewel Security Trade-Mark.

street, Chicago, for special use on their new Jewel Security gasoline stoves. It will be observed that it is in the form of a key, which is a symbol of security. A jewel is in the handle, and thus the firm's time honored name for their line of stoves is preserved in due connection.

ODD PLATES.

The Bellaire Stove Company of Bellaire, Ohio, have awarded to Jones & McGraw the contract for their new building, which will be 72 x 75 feet, and will adjoin the present foundry on the west side. They have also contracted with Dubois & McCoy for the remodeling of their pattern shops, and when the improvements are completed they will about double the manufacturing capacity.

The friends of the Weir Stove Company, Taunton, Mass., are to be congratulated on the handsome Glenwood desk calendar which they receive this year as a reminder of the well-known Heaters and Ranges of this firm. The calendar is a leather case of convenient size, with a pocket for holding the monthly cards, a supply being furnished for two years, making it literally a *fin de siècle* calendar.

The firm also distribute the Glenwood card calendars, which they are furnishing in quantities to their customers for general distribution. These are very pretty cards, daintily decorated with colored prints, making a modest reference to the Glenwood Ranges and carrying at the lower end a neat little calendar for 1898.

The Sun Vapor Stove Company filed articles of association at Detroit, Mich., on Friday, December 31. The capital stock, all of which is paid in, is $100,000. The stockholders are Edward G. Mummery, Robert S. Hutton, William G. Hastie and N. S. Wright.

Graff & Co. of Pittsburgh, Pa., resumed operations last week after a brief shut down for the usual inventory and repairs.

Fletcher, Russell & Co. of Warrington, England, send us a copy of one of their recently issued catalogues relating to Gas Heaters and Laboratory Appliances, the latter goods occupying the greater portion of the volume. The printing is beautifully done upon a fine quality of paper, and the binding is in embossed paper covers. The Laboratory Appliances cover a wide range, and the volume will be found of special interest to the trades addressed.

In *The Metal Worker* of January 1, page 37, we alluded to the corporation of the Walterstorff-Haskell Range & Furnace Company as being located in Minneapolis. This, however, is a mistake. The firm, as the trade well know, are now and have always been located in St. Paul, Minn., where they succeed the former business of the Walterstorff-Haskell Mfg. Company.

W. G. Creamer & Co., 96 John street, New York City, issue a catalogue for the year 1898 describing and illustrating the extensive line of Registers which they manufacture. In a special notice to buyers they state that they have made Hot Air and Ventilating Registers for more than 25 years, and call special attention to some of the special features of their goods. Their Flat Faced Registers are operated by a lever which permits easy adjustment with the foot and can be made to lock in any desired position. They also call attention to the Convex and Half Convex Registers. A number of other features are noted in their announcement which will interest the trade. The catalogue contains 44 pages and some of the goods are shown on colored paper, which permits the effective use of gold and silver printing. Full lists of prices and sizes are given.

The Phillips & Clark Stove Company, Geneva and Troy, N. Y., and Chicago, Ill., are distributing a calendar for the new year which is so arranged that it may be hung up or utilized as a card easel. The calendar proper is in the shape of the printed matter usually found in connection with the pocket memorandum books so extensively circulated during the past few years. The leaves are attached to the card in such a manner that a string passes over the front, thus holding the leaves open at any page or date desired. There are also yearly calendars for 1898 and 1899. It is referred to as a daily reminder, calendar, diary and memorandum combined, and is copyrighted by the Matthews-Northrup Company of Buffalo, N. Y.

We have received, with the compliments of the Bussey & McLeod Stove Company, Troy, N. Y., a very attractive calendar for the new year in the shape of a large card embellished with an oblong panel with a steel engraving entitled "Harvest Time." Below the panel are the leaves for the different months of the year, and also a yearly calendar. At the right is an inscription referring to the company's new line of Ranges, Parlors and Cooks for 1898, concerning which it is stated that no pains or expense have been spared to make them the best. Accompanying the calendar is a New Year's greeting, in connection with which the manufacturers state that it is intended this year to put out a line of Gold Coin Stoves and Ranges far in advance of all competitors. The new goods comprise a six-hole Grand Gold Coin Range, a four-hole Novel Gold Coin Range, two medium priced Ranges, a line of medium priced Steel Ranges, a new line of Base Burners and a new line of Oak Stoves.

The Richmond Stove Company of Richmond, Va., send us with their compliments a very pretty calendar for 1898 in the shape of a poster carrying the picture of a little girl holding in her hand a basket of flowers. She stands before a Japanese screen, the whole design being lithographed in bright and varied colors. The poster is bound at the top and bottom with a metal strip, and there is a metal eye for hanging it upon the wall.

De Haven & Co., Limited, Allegheny, Pa., issue a pretty little card wishing their friends a Happy and Prosperous New Year and many of them. In a neat folder which they are sending out they state that they will present for the spring trade a new line of Ranges, known as Duchess Cinderella, containing "some good ideas that are departures from the ordinary lines of Stove architecture." The departures, the manufacturers are satisfied, will meet the views of every well posted dealer and win the approval of the purchasing public. The Duchess Cinderella, it is said, will be "bright and attractive and will have a distinct individuality not found in any other line of ranges." Their salesmen will tell the trade more about them, and at the same time will show photographs of the goods.

D. G. Brennan, for many years connected with J. H. Woodruff & Co., but latterly with the Victor Stove Company, Salem, Ohio, has severed his connection with the company and accepted a position with the Fuller-Warren Company of Milwaukee, Wis.

The Taunton Iron Works of Taunton, Mass., makers of the Quaker Ranges and Heaters, are distributing with their compliments an exceedingly attractive calendar for the new year, in the shape of a large card provided with a silken loop for hanging it up. The card is of liberal proportions, measuring 11 x 14 inches in size, and has the greater portion of it devoted to a marine view showing the United States frigate "Constitution." Beneath the picture is a very brief history of "Old Ironsides," as the "Constitution" was familiarly known, together with a stanza from the well-known poem relating to the ship by Oliver Wendell Holmes. Across the center is the name and address of the company, together with a *fac-simile* of their trade-mark and an indication of the lines of specialties which they manufacture. The leaves for the different months of the year are printed in bold black figures upon a white ground, and give, in addition to the days of the week and month, the various phases of the moon.

At a meeting of the stockholders of the Yeager-Hunter Spring City Stove Works, held at Spring City on the 1st inst., the following officers were elected for the ensuing year: J. G. Yeager, president; J. Edgar Diemer, vice-president; J. Elwood Yeager, secretary; J. Evans Yeager, treasurer; and J. G. Yeager, J. Edgar Diemer, J. Elwood Yeager and A. Lincoln Tyson, directors.

Wm. Mackey & Sons, South Haven, Mich., have issued a neat catalogue, comprising 20 pages, setting forth the specialties which they manufacture. These consist of the Columbia four-hole Range, for wood; the Columbia, Waverly and New Waverly Cook Stoves, for wood, and the Roanoke Oak Stove. These goods are all made in several sizes. The Range and Stoves are supplied in all the usual styles.

The Stove dealers who are now receiving gorgeous envelopes of dark *cerisse* tint, otherwise cherry colored, will very probably find in them an announcement that an early call is to be expected from a representative of the Michigan Stove Company. The announcement is printed on paper of the same hue, that being one of the newest and most fashionable colors now ruling in select circles. The Michigan Stove Company are always to the front in these matters. Some one in that great establishment always knows "the latest." The circular is printed in a style which is radically different from the conventional circular. It folds in a way which suggests a four-page leaflet, but when it is opened that is found not to be the thing at all. The two pages are placed side by side, and face each other when folded, and then the top folds down and the bottom folds up and they fold together in the middle and the thing then looks like a book or something. The back of the circular is ornamented with a green dragon of the most horrifying type.

The Palermo Mica Company, 27 Peck slip, New York, have issued a new 1898 standard price-list of Mica, which differs only slightly from the former list in the smaller sizes. The company's business last year was rather ahead of that of 1896, but they are looking for a very decided improvement in the demand for Mica in the current year. The amount of inquiries already received since the opening of the year indicates a better feeling among consumers.

P. J. Crough has issued a circular letter to his friends in the trade bearing date of January 8, stating that he will represent as heretofore the Phillips & Clark Stove Company of Geneva and Troy, N. Y.

The Lehigh Stove & Mfg. Company of Lehighton, Pa., resumed operations Monday after a shut down of two weeks for the usual inventory and the making of some extensive repairs. We understand that during the year 1897 the plant was idle only 17 days.

The Cincinnati Steel Range Company of Cincinnati, Ohio, have decided to retire from the retail business and devote themselves entirely to wholesaling. They are building a large addition to their plant on Fifth street, in order to meet the demands of their growing wholesale trade.

The annual meeting of M. L. Nyberg & Co., Limited, was recently held at their offices, 1216-1218 Peach street, Erie, Pa. C. H. Hoffstetter was chosen president, E. D. Austin vice-president, John F. Skoog secretary, F. J. Demuling treasurer, and K. M. Wallhauser assistant

treasurer. The company are made up of young men of Erie who are doing an extensive business. Mr. Hoffstetter, who is also the manager, was for some time connected with the Detroit Stove Works and thoroughly understands the details of the business. The company manufacture Gas Stoves and Burners, and deal extensively in Stoves, Ovens, Kitchen Supplies, &c.

The Phillips & Clark Stove Company announce from their office at Troy, N. Y., that Hugh R. Chambers, who has been connected with the company for many years, will hereafter be located at the home office in Geneva, N. Y., as manager of the sales department. John H. Manns, for the past 16 years with Burdett, Smith & Co. of Troy, N. Y., will succeed Mr. Chambers in the territory formerly covered by him. The company announce that they are constantly adding new and improved patterns to their already large and extensive line and feel assured that their customers will be pleased with the latest product of their works—the Peerless Andes, a Range which the manufacturers regard as the finest which they have yet turned out.

The Armstrong Stove & Mfg. Company, Perryville, Md., are meeting with a foreign demand for their goods, and we understand they recently closed a contract for some of their Stoves for shipment to Ireland.

Noyes & Goddard of Waterville, Maine, have recently added a new 10 horse-power gasoline engine to their Stove foundry on Chaplin street, which takes the place of a water motor heretofore employed.

The R. H. Moody Stove & Mfg. Company, 741-745 Seventh street, Denver, Col., are steadily developing their business, and although organized only about a year ago have built up a large trade. They turn out high class Soft Coal Base Burners, Cook Stoves and Steel Ranges, and also give attention to all kinds of machinery castings. The Steel Ranges are made in different sizes and adapted to meet varying requirements. R. H. Moody, Jr., the practical head of the establishment, is a young man having a thorough knowledge of foundry work, and gives to all the business his personal and direct supervision. The company also have in connection with their works a finely equipped nickel plating plant.

After a continuous service of 18 years as traveling representative for the Sill Stove Works, Rochester, N. Y., and a total experience of 29 years on the road, Robert B. Johnson of Honeoye Falls has concluded to take a well deserved rest. At an informal gathering of the officers and salesmen of the Sill Stove Works last Tuesday evening Mr. Johnson was presented with a beautiful gold headed cane by the Sill Stove Works as an expression of their appreciation of his services and their personal esteem.

THE IRON MARKET.

The statistics of Pig Iron capacity printed in *The Iron Age* show that, as a whole, production continues at an enormous rate and that apparently consumption has been keeping up with it very well. Unless accidents happen January will be the banner month, with a production slightly exceeding 1,000,000 tons. How rapidly production has been expanding, under the stimulus of a rapidly growing demand, is shown by the following series of figures giving an estimate of the output monthly during the second half of 1897:

	Gross tons.
July	710,000
August	796,000
September	843,000
October	925,000
November	960,000
December	997,000
Total	5,221,000

During that period the stocks at the furnaces, excluding those belonging to Steel plants, have fallen about 275,000 tons.

It may be argued that the present tremendous rate of production, close to 12,000,000 tons per annum, is an element of extreme danger. The modest increase in stocks in December, say 10,000 tons of Anthracite and Coke Iron, proves that the consumption must be enormous, since December usually brings some slackening in the rate of melting Iron. We may even witness further drift in that direction and yet not have cause for alarm.

On the contrary, with the approach of spring we may be forced to face a very different state of affairs, and that is, a scarcity of Pig Iron in spite of a phenomenal output. As a matter of fact, the furnace capacity now available at present price limits is small. There are not a dozen stacks in the Central West which are in condition to produce economically. Many furnaces which might be rated as fairly modern would need many months to get into shape, while others would find it difficult to secure fuel or supplies of Ore for a long time.

The possibility of a shortage of furnace capacity during the current year is by no means a visionary dream. It is a contingency which the trade must keep in view. We know of instances in which it is a factor in determining purchases of metal now.

In the Steel trade there has been only a moderate movement. In Pig Iron the event of the past ten days has been the sale of about 60,000 tons of Bessemer Pig for the second quarter at $9.50, Cleveland. Southern Pig Iron producers have effected considerable sales in the West and the market is steadier.

In Finished Material the sales have been rather light.

Pig Iron.—Some pretty good sales have been made during the current week in the New York market, but the movement is not heavy. Some brands of Northern Irons are being offered for delivery during the greater part of the year at prices as low as were made last year. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $11.25 to $11.50; No. 2 Plain, $10.75 to $11. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.75; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

The Philadelphia Pig Iron market cannot be called active, neither can prices be called strong. In some cases they are steady, but there are not many sellers but would shade a trifle to secure orders from good customers. A more lively movement is liable to set in at any time, and although we repeat the old quotations, some brands can be had at 25c. less money, but a good deal depends on circumstances. General quotations are about as follows, subject to the usual freight differences at points within 100 miles south or west: No. 1 X Foundry, $12 to $12.25; No. 2 X Foundry, $11.25 to $11.50; Plain, $10.75 to $11.

The past week was quite active in Chicago, both with local producers and Southern sales agents. Large consumers who still have Iron due them on contracts are buying for delivery further ahead. The general trade are also buying quite liberally for their future requirements. A most interesting development of the past few days is the withdrawal of extreme low prices by Southern sellers. The Southern sales agents report the week as the best they have had for several months. Nothing new occurred in Lake Superior Charcoal, although it is reported that a little larger business has been done. We quote for cash as follows:

Lake Superior Charcoal	$12.50 to $13.00
Local Coke Foundry, No. 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.65 to 11.00
Southern Coke, No. 3	10.10 to 10.60
Southern, No. 1 Soft	10.75 to 11.25
Southern, No. 2 Soft	10.35 to 11.00

Foundry Irons continue quiet in the Pittsburgh district. We quote. f.o.b. Pittsburgh: No. 1 Foundry, $10.50 to $10.75; No. 2 Foundry, $10 to $10.25; Bessemer, $9.90 to $10.15.

In the Cincinnati district, business in Southern Pig Iron has been somewhat better during the past week than for any week within the past two months. The market is unquestionably steadier and but little complaint is heard of price cutting; the volume of inquiry is quite large; and a very fair business is being booked, mainly made up of orders for less than 500 tons, many of which come from parties who are also asking for terms on much larger lots. All signs seem to point to a heavy business at no distant day, and the feeling is that it will not take much buying to bring about a 25c. advance on present prices. Northern Irons are in the main in sympathy with the market for Southern stock, although there are some complaints that here and there prices have been and are being cut as much as 35c. below Southern lists. Some Ohio Iron is being offered very low. Quotations are as follows, f.o.b. Cincinnati :

Southern Coke, No. 1	$10.00 to .....
Southern Coke, No. 2	9.50 to ....
Southern Coke, No. 3	9.00 to ....
Southern Coke, No. 1 Soft	9.75 to ....
Southern Coke, No. 2 Soft	9.50 to ....
Southern Coke, Gray Forge	9.00 to ....
Southern Coke, Mottled	9.00 to .....
Ohio Silvery, No. 1	12.75 to $13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

The Pig Iron market in St. Louis has not shown any material change during the past week. The situation is generally regarded as being strong and the prices quoted below are believed to be about as low as furnaces are inclined to quote, and these prices are only for delivery during the next 60 days. For Iron required later than February higher prices are quoted. With no accumulation of stocks in either buyers' or sellers' hands it will be hardly possible for any material increase in the demand to take place without advancing prices. We quote as follows for cash, f.o.b. cars St. Louis :

Southern, No. 1 Foundry	$10.25 to $10.75
Southern, No. 2 Foundry	10.00 to 10.25
Southern, No. 3 Foundry	9.75 to 10.00
No. 1 Soft	10.00 to 10.25
No. 2 Soft	9.75 to 10.00

TRADE REPORT.

METAL MARKET.

Pig Tin.—Wholesale prices have advanced under the influence of good trade demand and moderate importations. Quite firm tone to advices from London has also helped to stiffen the market in some degree. There has been quite the average buying for consumptive wants and by jobbers, but speculative interest here remains dull and flat, in the absence of any incentive to operations in forward deliveries. Jobbers quote small lots of Straits Pig from store at 4½c. per lb.

Copper.—Exporters continue to buy very fairly in a quiet way, but home consumers' purchases are moderate and almost invariably for early delivery. The outward movement to all appearances still takes up enough of current production to prevent any burdensome accumulation, and prices are holding very steady both for wholesale and retail lots. Dealers' prices for small lots from store remain at about 12¼c. per lb. for Lake Ingot and 11¼c. for Ansonia Grade Casting Copper.

Sheet Copper.—There has been more inquiry for manufactured Copper, especially from the cornice making trade. The large number of important business and other buildings now going up in this city and vicinity call for a considerable quantity of Sheet Copper in their construction, and a large demand is expected to be developed as the year advances and the new structures progress toward completion. Meanwhile the current demand is not yet of large proportions, although orders showed some improvement over last week. Small lots of Sheet Copper from stock are quoted by retailers on the basis of 15c. per lb., a figure which does not prevail universally, however, although the tone of the material is firmer.

Pig Lead.—The demand from all quarters has been moderate, and deals involving more than a few carloads, mostly for early delivery, were strictly the exception. Wholesale prices have ruled very steady, however, in the absence of any disturbing influence. Jobbing orders have been limited to small lots for present use, which are quoted by jobbers at 4⅛c. per lb. for American Pig.

St. Louis advices report a dull market in Pig Lead, sellers quoting a higher rate than consumers are willing to pay.

Spelter.—The market remains in a flat condition with prices at last week's level. Retail quotations for good Western brands in small lots are at 4.40c. to 4.50 per lb.

St. Louis advices are as follows: Notwithstanding the continued effort made in certain directions to advance the market for Spelter there are plenty of producers who seem satisfied with the prices ruling to-day and do not consider the conditions justify any advance at this time. The demand is fairly strong.

Antimony.—Sales are running very fair, and prices remain steady at about 7¼c. for Japanese, 7½c. for Hallett's and 8½c. for Cookson's in small parcels from store.

Nickel.—The market is steady at 38c. per lb. for small lots.

Aluminum.—A fair demand is reported, with no change in prices, which are as follows: No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb.; 100-lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb.; 100-lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c per lb.; 100-lb. lots, 30c.

Tin Plate.—American Coke Plates were selling early in the week in a fairly liberal way for delivery extending over March and April, but the business in this direction fell off within the last day or two to very moderate proportions. A more or less keen competition for orders is noted, and while spot prices are fairly firm it is understood that offerings of Plates other than special shapes for forward shipment were made at the lowest prices of the year. The market is in a by no means satisfactory condition just at present. Many large buyers seem impressed with the idea that they will be able to secure more favorable rates by holding off their orders until later on, and some of the mills seem to be getting hungry for business, with the result of a weak and unsettled feeling in the market, at least so far as large business is concerned. The meeting of the Committee of Tin Plate Makers in Pittsburgh last week does not seem to have resulted in anything definite, but efforts to bring the mills together are still being actively carried on. The small trade in this section was more brisk during the past week, with a fairly large run of orders for material required for present use. Stocks everywhere are believed to be light. Jobbers' prices for small lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are quoted about as follows, but these rates are not infrequently shaded: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates, aside from a few specialties, are in extremely limited demand and prices remain largely nominal.

Sheet Iron.—There is a large volume of inquiry, which indicates a probable heavy demand for Black Sheets in the early future. Makers, however, are generally disinclined to book orders for future delivery except at an advance over current rates, while consumers are unwilling as yet to bid up to their level. It is understood that several important contracts are pending which involve deliveries covering the entire year. Comparatively active business has been transacted during the week in Black Sheets for prompt delivery, and a few good sized orders were placed covering the first quarter of the year. Prices meanwhile are somewhat irregular. Jobbers have experienced a fairly good demand from the smaller class of consumers for both Black and Galvanized Sheets, but the prices at which their sales were made were almost invariably low. Small lots from stock are quoted at about 2.35c. to 2.40c. for No. 27 Common Black Sheets, and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: A very good business is being done in both Black and Galvanized Sheets, not only in carload lots for early shipment but in the replacing of contracts for spring delivery. Few if any manufacturers are willing to take orders now for delivery beyond April. Buyers, however, are asking prices on summer delivery and are anxious to close. Small lots from stock are selling at 2.20c. to 2.25c. for No. 27 Black and 80 per cent. off for Galvanized.

Old Metals.—A better demand is noted for Old Brass for export, and also for Zinc; but the general market is somewhat unsettled, with a comparatively tame demand. Holders, however, have confidence in a better demand and prices before long, and are not pressing sales Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8 c.
Heavy Brass	per lb. 5¾c.
Light Brass	per lb. 4¾c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3¼c.
Zinc	per lb. 2¾c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10 50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton	5.25
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	4.50

The annual report of the New York State Board of Railroad Commissioners, presented to the Legislature at its meeting last week, says: "Physically, the railroads of New York State are in good condition, the trunk lines particularly so, both in the matter of roadbed and structures. The increase in gross earnings during 1896, amounting to nearly $11,000,000, was practically all expended in renewals. The roads were in consequence in better condition than at any time since the effect of business stagnation upon railroad earnings was made manifest. The figures show a loss in gross earnings of nearly $6,000,000 as compared with 1896, but a considerable increase over the years 1894 and 1895."

A monster iron curtain, the largest of its kind in the world, has just been completed for Olympia, a large London amusement palace. It is 240 feet long and 45 feet high.

CHICAGO REPORT.

Scrap.—Considerably more business is being done, but prices are no higher. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9¼c.
Red Brass	....	8 c.
Yellow Brass	....	6¾c.
Light Brass	....	4½c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—The demand is very light. The ruling prices of carload lots of 12 tons minimum are as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	7.00	7.25
Council Bluffs, Iowa	7.00	7.25
Lincoln, Neb	7.15	7.40
Sioux City, Iowa	7.50	7.75
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.65
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.00	7.25
Davenport, Iowa	6.30	6.65
St. Joseph, Mo	7.00	7.25
Leavenworth, Kan.	7.00	7.25
Omaha, Neb	7.00	7.25

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

The hopeful feeling which prevails in trade circles is a conspicuous feature of the situation. The business and financial conditions are regarded as specially favorable for trade in the near future and business is apparently beginning to show a perceptible improvement. Since the opening of the year, while it is too early yet to expect a heavy demand, there is an evidently hopeful tone and an encouraging volume. The trade, while still conservative and deterred by the caution which has been rendered habitual during the long continued depression, report improved conditions in their several localities and are replenishing their stocks with more freedom. Travelers are beginning to go out, and in a short time the trade will doubtless show the results of their activity. Prices are without important change. The steadiness in general which has characterized the market during the dull months and the advances, though comparatively few in number, which have taken place are regarded as excellent indications.

Advices from Chicago.—All the travelers connected with the local Shelf Hardware houses are not yet on the road, but will be this week, after which a much better idea can be formed as to what the new year has in store. The demand so far as it has been measured by the trade in progress has been particularly good, much better than usually seen so early in January. The weather for the past week has been remarkably mild, which would not seem to be conducive to trade. Despite this apparently unfavorable condition mail orders have been coming in freely. The Heavy Hardware trade is in extremely good condition, consumers purchasing very liberally. The outlook was never brighter. The railroads are especially large customers at present.

Advices from St. Louis.—The new year has opened very auspiciously for the Hardware trade. With only a third of the month gone the orders already received, both by mail and direct from traveling men, indicate that the present month will be a very satisfactory one. The demand for shelf goods has been particularly heavy, and in the way of Tinware and House Furnishing Goods generally the demand has exceeded general expectations. Hardware dealers are ordering very liberally and report trade with them as being exceptionally good. The farmer is commencing to spend some of his earnings of last year and the country Hardware dealer is beginning to feel the effect of this increased trade. The favorable feature of this improvement in trade is that it is nearly all cash business, thus enabling the dealer to discount his bills, which in many sections he has been unable to do for several years past. The general tone of prices is strong, and where advances have been made it is pleasant to note that they are being maintained. An instance of this kind is Screws, which are being firmly maintained at the recent advance. The general conditions governing the Hardware trade are satisfactory, and the jobbing trade are a unit in anticipating a large and profitable spring trade.

NOTES ON PRICES.

Wire Nails.—The past week has witnessed some increase in the demand for Wire Nails, but the trade are not disposed to purchase in a speculative way at present prices. A good many orders for moderate quantities are, however, being received by the manufacturers, who are now accepting orders for delivery during next month, refusing to make contracts for execution later in the season. Those interested in the consolidation of Wire interests are still working in this direction, their attention being given to valuation of plants, a work requiring much labor and time.

Advices from Chicago.—The conditions of trade for the past two months have been very different from what they usually are at this season. It generally happens that during these two months business is extremely dull and prices drop to a very low point, but this year the prospect of the consolidation of Wire Rod interests has braced up the market and manufacturers will consequently go into the spring with large orders booked at satisfactory rates. Jobbers have not advanced their quotations to correspond exactly with those made by manufacturers and quote small lots from stock at $1.60 and carloads $1.55.

Advices from St. Louis.—The improvement noted in our last issue continues to dominate this department. The feeling is gaining ground daily that the Wire combination is assured, and that in consequence prices must of necessity be advanced. Jobbers report an excellent trade, and quote $1.65 to $1.70, base, for small lots from store.

Cut Nails.—With the resumption of business after the holiday season there is a somewhat increased demand for Cut Nails, but the amount is moderate and the market only fairly steady.

Advices from Chicago.—A light movement is reported in Cut Nails, with prices of small lots unchanged at $1.45.

Advices from St. Louis.—The improvement in Wire Nails has not as yet had any effect on Cut Nails, which continue to be quoted as heretofore. Jobbers ask $1.45 to $1.50, base, for small lots from store.

Barb Wire.—The manufacturers of Barb Wire are confident of a large business during the coming season, and prices are firmly maintained.

Advices from Chicago.—A very good business is reported by manufacturers, who are now well sold up for January and beginning to book orders for February delivery. Jobbers' prices are unchanged at $1.60 for Painted and $1.90 for Galvanized.

Advices from St. Louis.—The demand for Barb Wire is unusually heavy, and it has made its appearance earlier than the trade anticipated. With no large stocks in either the factories or with jobbers an advance in price is not surprising. Jobbers report a heavy trade, and quote Painted at $1.70, with 30 cents per hundredweight advance for Galvanized.

Smooth Wire.—The market in Smooth Wire is without change. There is a larger volume of business, and the market is firm.

Glass.—A large proportion of the Window Glass factories went into operation on January 8 and new Glass is expected to be in market by the last of the month. The policy of the American Glass Company, as outlined by reports, is to be a more liberal one to the jobbers than that pursued by the agencies last year. The jobbers, according to reports, are to be considered the best fitted to handle their own trade, so that the company will solicit business only from jobbers. It is understood that the

market will be kept for domestic Glass and that every effort will be made to supplant the imported article. The American Company consider the average advance of the new price-list and discounts to be about 7½ per cent. over the prices ruling in July, 1897, previous to the recent inflated prices. The advance is referred to as giving in the East an average advance of about 5 per cent. and in the West an average advance of about 10 per cent., the list of the first brackets having been increased, while the increase shades off as the sizes advance.

White Lead.—Orders are being placed somewhat more freely for Dry Lead for delivery in the immediate future, and to all accounts quite as liberally as usual at this period of the year. The distribution of Lead in Oil is also meeting expectations and seems to be helped along by the strong position of the market for Linseed Oil. The latter article is not as high in price as the position of raw material would seem to warrant, but offers are more reserved and not without indications that both Eastern and competing producers are at present more inclined to go slow than to be vigorously aggressive. Pig Lead, however, is not as strong in price as market conditions would seem to warrant, and that fact evidently has a restraining influence.

Red Lead.—There has been quite the average business in Red Lead, but dealings were of ordinary character and at virtually the prices that have been quoted for a considerable time past.

Linseed Oil.—The course of the market for raw material has been decidedly upward. Prices, in fact, have reached the highest point of the season. Oil sympathized in superficial way only, however, although relatively much the lowest, but city crushers are more reserved in their offerings and out of town competition has minimized in no uncertain way.

Spirits Turpentine.—In sympathy with higher cost at the South wholesale prices here have moved up, and the market is very firm at the advance. Consumers and jobbers purchased fairly, but speculative operations were largely accountable for the advance.

Old Rags, Paper, &c.—The market for Paper Stock has been quiet, with prices unchanged, but generally firm. Dealers are paying about the following rates for New York City delivery:

No. 1 White Rags	per lb.	2⅝ to 2¾c.
No. 2 White Rags	per lb.	1¾ to 1⅝c.
Mixed Rags	per lb.	1 c.
Blues and 3ds	per lb.	1 c.
Hard Sized White Shaving	per lb.	1¾ to 2 c.
No. 1 White Book Shavings	per lb.	1½c.
No. 2 White Book Shavings	per lb.	¾ to 1 c.
Light Book Shavings	per lb.	½ to ¾c.
No. 1 Mixed Shavings	per lb.	¾ to ⅞c.
No. 2 Mixed Shavings	per lb.	½ to ⅝c.
No. 1 Printed Books	per lb.	⅞ to 1 c.
Ordinary Mixed Books	per lb.	½c.
Newspapers	per lb.	½ to 3/5c.
No. 1 Manila Paper	per lb.	⅝ to ¾c.
No. 2 Manila Paper	per lb.	⅜ to ½c.
Bogus Paper	per lb.	⅜c.
Common Paper	per lb.	¼ to 3/10c.
Straw Chips	per lb.	⅜c.
Binders' Clippings	per lb.	½c.
Jute Butts	per lb.	1⅛ to 1¼c.
No. 1 Jute Bagging	per lb.	¾ to 1 c.
Mixed Bagging	per lb.	½ to ¾c.
No. 2 Bagging	per lb.	½ to ¾c.
Hemp Twine	per lb.	1⅜ to 1¾c.
Manila Rope	per lb.	1¾ to 2 c.
Jute Rope	per lb.	1½ to 1¾c.
Mixed Rope	per lb.	¾ to ⅞c.

Old Rubber.—A fair demand is noted and prices show no quotable change. Local dealers are paying about the following figures :

Car Springs, ton lots, per lb	3½ c.
Rubber Shoes, carloads, delivered at factory, per lb	4¾ to 5 c.
Rubber Shoes, less than carloads, per lb.	4.70c.
White Wringer Rolls, per lb	4 c.
White Syringes, per lb	4 c.

Major Leach of the United States Engineer Department has prepared a report upon the proposed improvement of the Connecticut River so as to render it navigable to Holyoke, in which he declares the scheme to be perfectly practicable and worth undertaking. The estimated cost of the improvement, which would involve three locks and movable dams, is $2,000,000. The saving in freight rates and the increase in traffic secured would, he believes, soon pay a return on several times that sum.

A press dispatch from Halifax, Nova Scotia, asserts that a second Klondike has been discovered in Labrador by representatives of an American and Canadian company, who went there for the purpose of erecting saw mills. They report that gold deposits of great richness exist in Labrador. Arrangements are being made for an expedition of prospectors to that country in the spring.

The figures of ocean travel for 1897, just compiled by Wm. C. Moore, landing agent at the port of New York, show a decided falling off in the transatlantic passenger business last year as compared with 1896. The number of cabin passengers landed was 90,932, and steerage 192,004, as compared with 99,223 and 252,350 respectively in 1896, although the number of trips increased from 852 in 1896 to 901 last year.

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Metal and Miscellaneous Prices.

CHICAGO, JANUARY 13, 1898.

Tin—

Straits pigs.....15½@15¾¢

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
IX, 14 x 56	21.00	$12.50
IXX, 14 x 56	24.00	14.00
IX, 14 x 60	23.00	13.50
IXX, 14 x 60	27.00	15.00

American Tin Plates—

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	6 75
	IXX, 14 x 20	8.25
	IXXX, 14 x 20	9.75
	IXXXX, 14 x 20	11.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.50
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$3.75
	IC, 10 x 20	5.50
	IC, 17 x 17	7.75
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.00
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.50
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 lb.....15¢
95 lb.....20¢
90 lb.....25¢
85 lb.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	10.50@ 12.00
Worcester Grade, 12 to 14 lbs. coating	8.00@ 9.00
STP Grade, L 10 to 12 lbs. coating	7.50@ 8.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	1.80¢	2.50¢
17 to 20	1.90¢	2.60¢
21 to 24	2.00¢	2.70¢
25 and 26	2.10¢	2.80¢
27	2.20¢	2.90¢

Russia, Planished, &c. 100 lb.

Patent Planished, ℔ lb, A....$10.20 } 10%
Patent Planished, ℔ lb, B.... 9.20 } dis.
Craig's Polished Sheet Steel.....8½¢
U.S. Polished Sheet Steel No. 27 A 5.45¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ lb additional.

Brazed Brass Tubing, (100 lb lots).

(To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....3¢ advance.

Roll and Sheet Brass. (100 lb lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots..... ℔ lb, 40¢
100-lb lots.....℔ lb, 36¢

No. 2 (guaranteed over 90% pure).
Small lots.....℔ lb, 34¢
100-lb lots.....℔ lb, 33¢

Nickel Aluminum Casting Metal.
Small lots.....℔ lb, 39¢
100-lb lots.....℔ lb, 35¢

Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....℔ lb, 35¢
100-lb lots.....℔ lb 30¢

Aluminum Rolled Rods, from ¾ to 1 inch diameter.....℔ lb, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter.....℔ lb, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 lb or more. Less quantities, 5¢ ℔ lb additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	℔ lb	℔ lb	℔ lb
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-lb casks.....5¾¢
300-lb casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&5%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax.....2.20 square
The Lloyd Spanish Tiling.. 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.35

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. ℔ square,	$4.75	$4.50
Galv. ℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—
Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—
$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—
Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20..... 8.00 square
Steel Painted, 14 x 20.. . 7.50 square

Cortright's Metal Slates—
14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—
10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....℔ lb 2 ¢
" " Brown.....℔ lb 1½¢
" " Purple.....℔ lb 2½¢
" " Ground in oil, B. Red, ℔ lb 6½¢
" " Ground in oil, Red...℔ lb 6½¢
" " Ground in oil, Brown, ℔ lb 5½¢
" " Ground in oil, Purple, ℔ lb 6½¢
Linseed Oil, Boiled, in bbls.....42¢
Linseed Oil, Raw, in bbls.....40¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....3 ¢
kegs.3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal..... .34¢
Spirits Turpentine, in bbls., ℔ gal..36½¢
Asphaltum, Trinidad Refined, ℔ ton.$45
Tarred Felt, 1 Ply, ℔ 100 lb.....$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet.....$1.25
Roofing Pitch, ℔ bbl of 300 lb.....$3.00

NEW YORK, JANUARY 14.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....℔ lb, 40¢
100-lb lots.....℔ lb, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....℔ lb, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	℔ lb	℔ lb.	℔ lb.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.58	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ℔ lb extra.

Antimony—

Cookson.....℔ lb, 8¾¢
Hallett's.....℔ lb, 7½¢
Japanese.....℔ lb, 7¼¢

Brass—Planished.....net

Roll and Sheet.....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¾-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅜-in. up to ½-in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger	Special
2-in. to 3-in., to No. 19, inclusive	.38

35% off.

Copper & Bronze Tubing—

3¢ ℔ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—
Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats℔ lb 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ℔ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....℔ lb,	2.00....	2.30¢
Nos. 17 to 21.....℔ lb,	2.10....	2.40¢
Nos. 22 to 24.....℔ lb,	2.20....	2.50¢
Nos. 25 and 26...℔ lb,	2.30....	2.60¢
No. 27.....℔ lb,	2.40....	2.70¢
No. 28.....℔ lb,	2.50....	2.80¢
American B. B.....℔ lb,		4¢

Russia, Planished, &c.
Genuine Russia, according to assortment.....℔ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ℔ lb, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....℔ lb 8½¢

Galvanized.

Nos. 10 to 16.....℔ lb,	12¢	75&10& 5% off.
Nos. 17 to 21.....℔ lb,	13¢	
Nos. 22 to 24.....℔ lb,	14¢	
Nos. 25 to 26.....℔ lb,	15¢	
No. 27.....℔ lb,	16¢	
No. 28.....℔ lb,	17¢	
No. 29.....℔ lb,	19¢	
No. 30.....℔ lb,	21¢	

36 in. 1¢ ℔ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ℔ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....87¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb.....5¾@6¢
Lead. Amn. White, in oil.....5¾@6¢
Lead, Red. bbls. and ½ bbls.....5¾@6¢
Lead, Red, kegs.....5¾@6¢
Ochre, American.....@1½¢
Red Venetian, American.....@1¾¢
Linseed Oil:
Raw, ℔ gal.....43@44¢
Boiled.....45@46¢
Spirits Turpentine:
In bbls.....35@35½¢
In cases.....43@43½¢
Putty:
In barrels and ½ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....℔ lb 5 ¢
Clarified.....℔ lb 4⅞¢
Accra.....℔ lb 4¾¢
Half Jack.....℔ lb 4½¢
Cecilia.....℔ 100 lb $4.85
Choice Red.....℔ 100 lb 4.60
(*Spot Oil, ½c. ℔ lb higher.*)

Petroleum Products—

In Barrels (Barrel Included).
Stove Gasoline.....℔ gal. 10@11¢
Kerosene.....℔ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.
Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Pings..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ℔ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....70%
Galvanized Iron Range Boilers above 52 gallon.....70%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....65%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized.....50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.
Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Brouze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	℔ lb	℔ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ℔ ton.....$30.00@$35.00
Asphaltum, Rock, ℔ ton.....$14.00
Coal Tar Felt, 1 ply, ℔ lb.....2¢
2 Ply Roofing, ℔ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ℔ roll, 108 sq. ft..... 1.35
Roofing Pitch, ℔ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.	℔ bbl.	$1.47@$1.48
Rosin, E & F.	℔ bbl.	1.52@ 1.60
Rosin, G. & H.	℔ bbl.	1.65@ 1.70
Rosin, I. & K.	℔ bbl.	1.80@ 1.90
Rosin, M. & N.	℔ bbl.	2.10@ 2.45

Seamless Brass Tubes—

Net List, Feb. 1. 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ℔ sqr.	$3.75@$5.00
No. 1 Bangor Ribbon	3.35@ 3.75
Pen Argyle. ℔ sqr.	3.75@ 4.35
Peach Bottom, ℔ sqr.	4.75@ 5.60
No. 1 Chapman, ℔ sqr.	3.80@ 4.80
Lehigh Slates, ℔ sqr.	3.00@ 4.50

Vermont:

Sea Green, ℔ sqr.	$2.50@$3.55
Purple, ℔ sqr.	3.25@ 4.00
Unfading Green, ℔ sqr.	3.75@ 4.50
Red, ℔ sqr.	9.00@11.00

Solder and Soldering Fluids— Solder—

½&¼ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f o.b. New York.
In barrels. ℔ lb.....4¢
Smaller quantities, ℔ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ℔ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ℔ lb.....3½¢
½ bbls., about 300 lb, ℔ lb.....4¢
Kegs, about 110 lb, ℔ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ℔ lb.....4¢
5% dis.

Yager's Soldering Salts.
½ lb bottles, each.....30¢
Large quantities, ℔ lb.....40¢

Soldering Coppers—

Per lb.....15½¢@17½¢ net

Spelter—

Western Spelter..... 4.40@4½¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ℔ lb.....15½¢
Straits, pigs, lb lb.....14½¢
Straits, in bars, ℔ lb.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20	5.75
" "	IXXX,	14 x 20	6.50
" "	IXXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:
100 lb.....10¢
95 lb.....15
90 lb.....20¢
85 lb.....25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating.....	8.00 @ 9.25
STP Grade, 10 to 12 lb coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ℔ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20	$5.00
" "	IX,	14 x 20	6.00
Allaway Grade,	IC,	14 x 20	4.25
" "	IX,	14 x 20	5.00

Coke Plates, Bright—

Steel Coke,	IC,	14 x 20 ..... $4.25
	IX,	14 x 20 ..... 5.25

Terne Plates—

Worcester Grade,	IC,	14 x 20..... 4.25
		20 x 28..... 8.50
Dean Grade,	IC,	14 x 20..... 4.00
		20 x 28..... 8.00
Glibertson's Old Method,	IC,	14 x 20.. 7.50
		20 x 28.. 15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ℔ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain	72%
1¼ and less, Galv.	67%
1½ and larger, Plain.	78%
1½ and larger, Galv.	70%
Screw and Socket Joint Casing	65%
Inserted Joint Casing	60%
Boiler Tubes, 2¼ inch and smaller.	72½%
" 2½ inch and larger	75%

Zinc—

600 lb casks ℔ lb 5¾¢ | Per lb.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Wheeler, Russel & Son, Utica, N. Y.

Aluminum.
Reymond & Gottlob, 26 Cortlandt St., N. Y.

Architectural Ornaments.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
Willis Mfg. Co., Galesburg, Ill.

Ash Cans.
Central Stamping Co., 23 & 25 Cliff St., N. Y.
Dover Stamping Co., Boston, Mass.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Books.
Tower, F. W., Springfield, Mass.

Bronze and Bronzing Liquid.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eiler, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Cocks, Ball, Basin and Stop.
Landers, Frary & Clark, New Britain, Coun.
Peck, Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros. Co., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawreuce-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.

Conductor Pipe Machinery.
Poorman Mfg. Co., Piqua, Ohio.

Cookers, Steam.
Hill-Whitney Aluminum Co., Boston, Mass.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marilu & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Crimping Machines.
Packham Crimper Co., Mechanicsburg, Ohio.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.

Dampers.
Berger Bros. Co., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.
Oster Mfg. Co., Cleveland, Ohio.

Dinner Pails.
Kleckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dumb Waiters.
Energy Mfg. Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Eiler, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Hangers.
Berger Mfg. Co., Canton, O.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

Enameled Ware.
Lalance & Grosjeau Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Carton Furnace Co., Utica, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water St., N. Y.
Griffing, A. A. Iron Co., 66-68 Centre St, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Pease, J. F., Fce Co., Syracuse, N. Y.
Richardson & Morgan Co., 92 Beekman St., N. Y.
Richmond Stove Co., Norwich, Ct.
Ridgway Furnace Co., Boston, Mass.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Thatcher Furnace Co., 240 Water St., New York.
Tubular Heating & Ventilating Co., Phila., Pa.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Shepard, Sidney & Co., Buffalo, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.
Wilson, F. Cortez & Co., Chicago, Ill.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Gutter Formers.
Whelan, Dennis, J., Troy, N. Y.

Hammocks.
Palmer, I. E., Middletown, Ct.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Howard Furnace Co., Syracuse, N. Y.
Magee Furnace Co., Boston, Mass.
Mitchell Heater Co., Poughkeepsie, N. Y.
Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., Fce Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Richardson & Morgan Co., 92 Beekman St., N. Y.
Richmond Stove Co., Norwich, Conn.
Smith Co., H. B., 135 Centre St., N. Y.
Thatcher Furnace Co., 240 Water St., New York
Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

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Griswold Mfg. Co., Erie, Pa.
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Iron, Kalamcined.
Republic Iron works, Pittsburgh, Pa.

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Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Lard Cans.
Kleckhefer Bros. Co., Milwaukee, Wis.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Huse, Jos. & Son, Boston, Mass.
Munsell, Eugene & Co., 218 Water St., New York.

Milk Cans.
Shepard, Sidney & Co., Buffalo, N. Y.

Nickel Plating Outfits.
Eddy Electric Mfg Co., Windsor, Conn.

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Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pipe Fitter and Crimper.
Blumer, Doscher Mfg. Co., Brooklyn, N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Pipe, Water and Gas.
Millar, C. & Son, Utica, N. Y.

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Kelly, Thos. & Bros., Chicago, Ill.
Landers, Frary & Clark, New Britain, Conn.
National Pipe Bending Co., New Haven, Conn.
Oster Mfg. Co., Cleveland, Ohio.
Peck Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wheeler, E. S. & Co., New Haven, Ct.
Wilson, R. M., Rome, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Adriance Mach. Works, Brooklyn, N. Y.
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Gordon, W. J., Philadelphia, Pa.
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Smith, H. B. Co., 135 Centre St., N. Y.

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Cope, G. W., Detroit, Mich.
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Vedder Pattern Works, Troy, N. Y.

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Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.

Ringen Stove Co., St. Louis, Mo.

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Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgertou, Wis.
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North Penn Iron Co., Phila., Pa.
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Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
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Gummey, McFarland & Co., Phila., Pa.
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Meurer Bros. Co., Brooklyn, N. Y.
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Wind Gates.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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A SALESMAN experienced in the tinware and kitchen furnishing lines, and acquainted with the trade in the New England States. Address, stating age, experience, when and where, references and wages expected "S. M. C.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

A good all round TINNER; must understand furnace work; must be sober and steady; steady work the year round. 386 New York street, Aurora, Ill. Jan. 15

An experienced GALVANIZER and RETINNER to take charge of galvanizing and retinning plant, capable of doing this work in all its branches; must be an A1 workman, strictly temperate and well recommended; give past experience and wages desired. Lock Box 2141 Batavia, N. Y. Jan. 15

A man with good experience and acquaintance among architects and builders to solicit orders for cornice and roofing work. "L. D.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

An up to date stove, furnace and range SALESMAN for New York City, Brooklyn, New Jersey and vicinity; one who has a trade that he can control; give full particulars. "H H. H.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

Practical stove mounter as FOREMAN of mounting department in stove, range and furnace foundry; one who has had large experience and capable of filling all requirements pertaining to that department; one who has had some experience in that position and capable of handling men preferred; give full particulars. "A. B. C.," office of *The Metal Worker*, 117 and 119 South Fourth street, Philadelphia, Pa. Jan. 15

A first-class jobbing ROOFER; one who understands range and furnace work preferred; steady job; wages $3; nine hours; non-union shop in Brooklyn J. H. Whitley, 193 Fulton street, Brooklyn, N. Y. Jan. 15

Agents to sell on commission nickel plated copper specialties for household use in Delaware, Maryland, West Virginia, Kentucky, Tennessee, Wisconsin and Northern Michigan, also Canada "N. C.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

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Three first-class STOVE PATTERN FITTERS wanted by Rathbone, Sard & Co., Albany, N. Y. Jan. 8

A first-class TINNER; wages must be low; only those with first-class reference need answer. 233 Twenty-fifth street, Newport News, Va. Jan. 8

A SALESMAN familiar with steel French ranges among the hotel and restaurant trade of New York City and vicinity; must have experience and an acquaintance with this class of trade. "French Range," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

One first-class TINNER; one who can repair bicycles preferred; steady employment for the right man, in village of 1200 inhabitants; no floaters need apply; references required. Box 65, Shortsville, N. Y. Jan. 8

SALESMAN for 1898; side line; pays 20 to 25 per cent. commission; state territory covered. "S. O. Co.," Viaduct Arcade, Cleveland, Ohio. Jan. 8

TRAVELING SALESMAN calling upon the stove trade will find an advantageous arrangement possible on commission basis, selling steel ranges, air tights and other sheet metal goods for us; state present lines carried. Detroit Galvanizing and Sheet Metal Works, Detroit, Mich. Jan. 8

DIPPERS and BURNERS in an enameling factory; state experience and wages expected. "O. S.C.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

SALESMAN to sell a first-class line ranges and furnaces to building trade; must have the acquaintance of architects, and experience in building trade in New York City and vicinity; references. Address with particulars, "Ranges and Furnaces," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

SITUATIONS WANTED.

By a young man 19 years of age, as TINSMITH in some country shop; has had about four years' experience at tinning, pump and stove work; has also worked at plumbing; can furnish references; reasonable wages expected. Roscoe Batey, P. O. Box 99, Patchogue, L. I. Jan. 15

By a young man who has had nine years' experience at all kinds of tin and sheet iron work; can do a fair job of plumbing, run a store if necessary; references as to character and ability; married. "Plumber," care Empire Store, Salamanca, N. Y. Jan. 15

A BOOKKEEPER or SALESMAN in store handling stoves, ranges, furnaces, &c.; can figure estimates and oversee work; five years' experience. "C.," office of *The Metal Worker*, 70 Kilby street, Boston, Mass. Jan. 15

As SALESMAN for a tin plate mill in Chicago and the West, making bright, coke and terne plates; long experience, best references. "Tin Plates," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 15

An experienced energetic HARDWARE SALESMAN wishes to represent a live manufacturer of wire nails and barbed wire in New York State on commission for 1898; highest references furnished. "C. R.," 192 Hoyt street, Buffalo, N. Y. Jan. 15

By a PLUMBER 22 years of age; can do roofing and spouting; can furnish references from last employer; steady job desired. P. E. Burke, 30 New street, Orange, N. J. Jan. 15

As FOREMAN of a stove foundry, by one who has had 20 years' experience, part of time interested; understands it thoroughly in all the branches, being a mixer and melter of iron; also a practical follow board and flask maker. "Foundry Foreman," office of *The Metal Worker*, 22-24, Pickering Building, Cincinnati, Ohio. Jan. 15

Boy 17 years of age desires to learn the plumbing or tin and sheet iron trade; strong and willing; high school education, good habits. Axel Swenson, 27 Jaggar avenue, Flushing, N. Y. Jan. 15

By a young man, single, of sober industrious habits; seven years' experience in the retail plumbing business; can estimate work from plans for plumbing, steam, gas and water fitting; a good bookkeeper and stock man. "Frank," 563 Mulberry street, Macon, Ga. Jan. 15

By a good all around TINSMITH, used to heater work and general jobbing; can do piping, some knowledge of plumbing, single and temperate, 30 years' experience; moderate wages for a permanent position. G. Hitchcock, 209 Main street, Poughkeepsie. Jan. 15

An experienced steam and hot water SALESMAN, who can command a considerable trade, wants to make an engagement with a substantial manufacturing house in the boiler or stove trade: is competent to design boilers and superintend the making of oiler patterns; has designed heating systems for several years successfully; will exchange references and satisfy as to ability with a good house that is progressive. "Circulation," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

FURNACEMAN open for a good connection; competent to sell high grade heating systems; an expert in laying out successful working furnace jobs; can cut patterns and do sheet iron work; have managed shops employing a number of men; have had charge of the complaint department of a large manufacturing house; prefer a suburban location; can satisfy as to ability of high class and character; permanent connection is desired with first-class house that can afford to pay what service rendered is worth: have had a long experience. "Competent Furnaceman," office of *The Metal Worker*, 232-238 William street, New York. Jan. 15

By a first-class mechanic as FOREMAN and CUTTER in a roofing, cornice and skylight shop, thoroughly understand the business and how to handle help; steady and temperate "Foreman," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

TINNER and PLUMBER, good workman in all branches of the trade, such as roofing, spouting, steam and hot water heating; wages $2 per day. George Horne, Phillipsburg, Centre County, Pa. Jan. 15

By a first-class PLUMBER, GAS and STEAM FITTER, good on hot air furnace work and roofing; Ohio preferred; can estimate on all work from plans. W. P. McGimpsey, McConnellsville, Ohio. Jan. 15

Steady position by a man 27 years of age, who has had ten years' experience at STEAM, HOT WATER FITTING and PLUMBING; can do all kinds of pump work, roofing and spouting; strong and healthy; 6 feet tall, strictly sober, and some knowledge of stove business. "H. M. S.," Box 75, Lititz, Pa. Jan. 15

An experienced salesman in retail hardware would like a place as CLERK or BOOKKEEPER after April 1. D. H. Williams, Gouverneur, N. Y. Jan. 15

To correspond with manufacturer of tin plate, steel roofing and other tin and iron specialties to represent them in a small territory in Northern Indiana; I am visiting tin shops and hardware stores; work on commission. "C. W." Box 568, Waterloo, Ind. Jan. 15

By an up to date WROUGHT STEEL RANGE BUILDER and MOUNTER; can handle help; well posted on steel cooking apparatus. "W. R. B.," 1184 Jefferson avenue, Detroit, Mich. Jan. 15

Steady situation by a young man at tin, sheet iron work, tin roofing, pump or iron pipe work; references; single; sober; wages moderate. Box 246, Cato, N. Y. Jan. 15

By a practical sanitary and heating ENGINEER with a good firm either at home or on the road; 22 years' experience; references exchanged and satisfaction guaranteed. "B. C.," 63 West Union street, Kingston, N. Y. Jan. 15

By a practical TINSMITH, 20 years' experience at tin and sheet iron work, furnaces, stoves and ranges; speaks German and English; sober and industrious; references. Geo. Beinkampen, 443 Main street, Paterson, N. J. Jan. 15

By a TINSMITH and GENERAL JOBBER, 18 years' experience; understands furnaces, pumps, gutter work and plumbing; some experience in the hardware business; sober and steady; state wages. Fred O. Dawson, Wallingford, N. H. Jan. 15

By a TIN and SHEET IRON WORKER and GENERAL JOBBER; city or country; accustomed to gutters, leaders, heater and range work; eight years' experience; strictly sober; single man; can furnish good references if required. Henry A. Wolfson, 73 East 106th street, New York City. Jan. 15

SALESMAN with an established trade with the stove, hardware, tinware and house furnishing trade in New York City and vicinity; also New York State, New Jersey and Connecticut; can speak German and English; would like to make a change at once. "Road 1898," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

By a TINSMITH and ROOFER. Jacob Westenberg, 436 Summit avenue, Hoboken, N. J. Jan. 15

To travel for some metal and tinners' supply house; a practical tinner of 35 years' experience; Northern New York preferred. J. B. Gates, Hermon, N. Y. Jan. 15

By a young man as TRAVELING SALESMAN or in wholesale stove or plumbing house; salary no object until he can show what he is worth; has been in the business six years; best of references. Chas. H. Jones, 136 King street, Northampton, Mass. Jan. 15

As TRAVELING SALESMAN for 1898; seven years' experience on the road in the stove, range and furnace line, or would engage with stamping company or manufacturer of hardware specials; territory covered, Middle Western States, Northwestern Pennsylvania and New York; A1 references. "Specials," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

As SUPERINTENDENT, by a first-class, experienced, practical foundryman; way up in all lines of manufacture of stoves, furnaces and light core work; am a successful furnaceman and good manager of men; best of references. "Superintendent," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

As SALESMAN and SOLICITOR for roofing and sheet metal building material; ten years' practical experience in the business and four years on the road; A1 references. "X.," 615 North Fourth street, Steubenville, Ohio. Jan. 15

A CORNICE and SKYLIGHT MAKER of seven years' experience, with a fair knowledge of cutting, would like to finish the trade as cutter and draftsman in some good shop; wages reasonable. 28 years of age. "Cornice Worker," 79 Green street, Newark, N. J. Jan. 15

A STOVE PATTERN MAKER, ARTISTIC CARVER and DESIGNER with 25 years' experience would like to engage with a stove foundry at altering and redressing the wood patterns for the market up to the present style; will give references and photos of his ability in getting up new work. "Expert," Troy Artistic Stove Pattern Works, 458 River street, Troy, N. Y. Jan. 8

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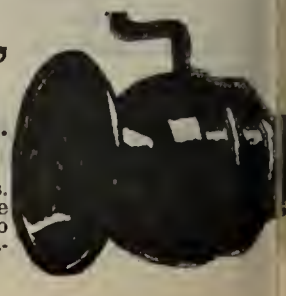


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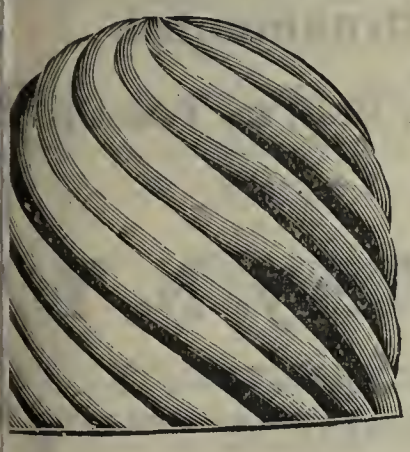


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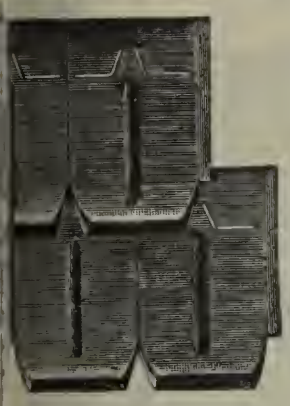
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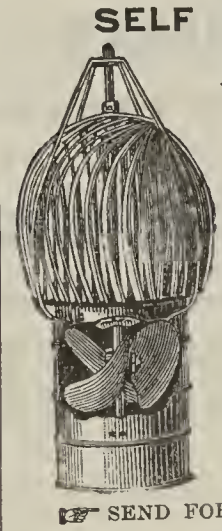
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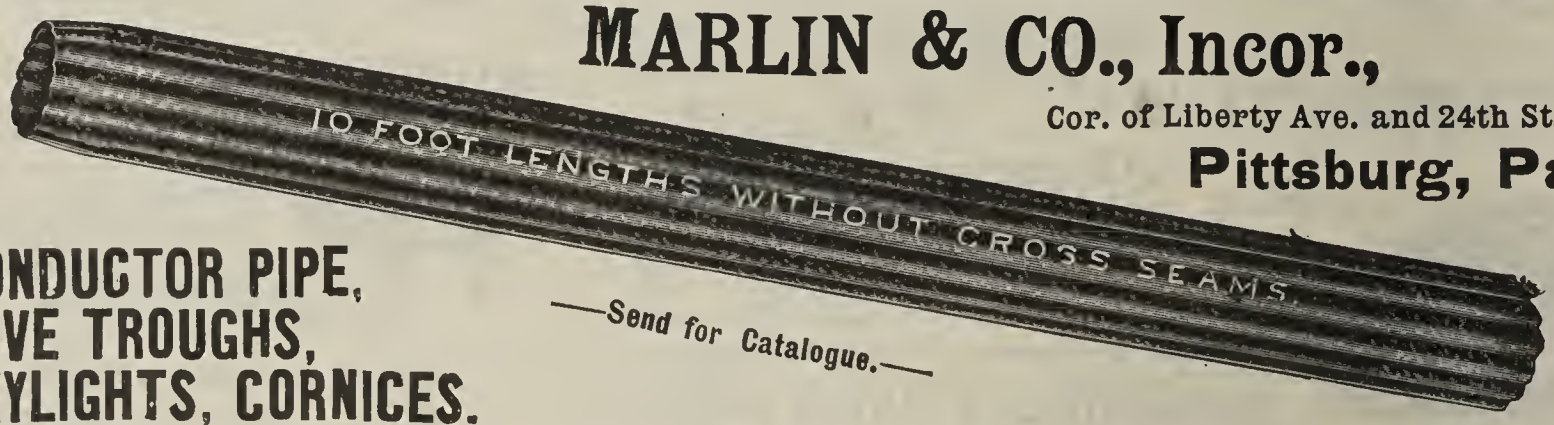
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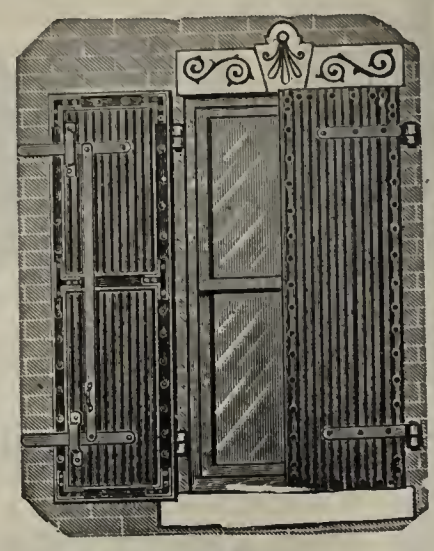
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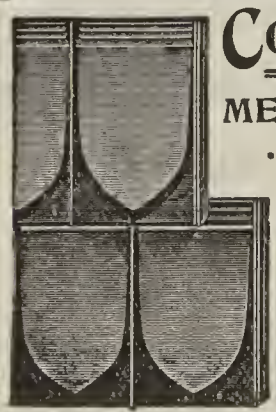
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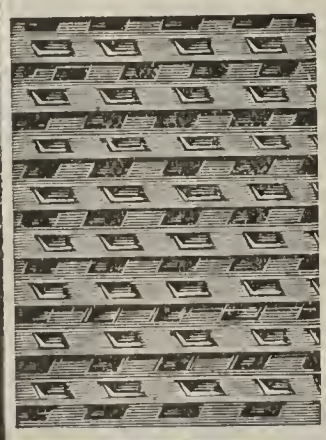
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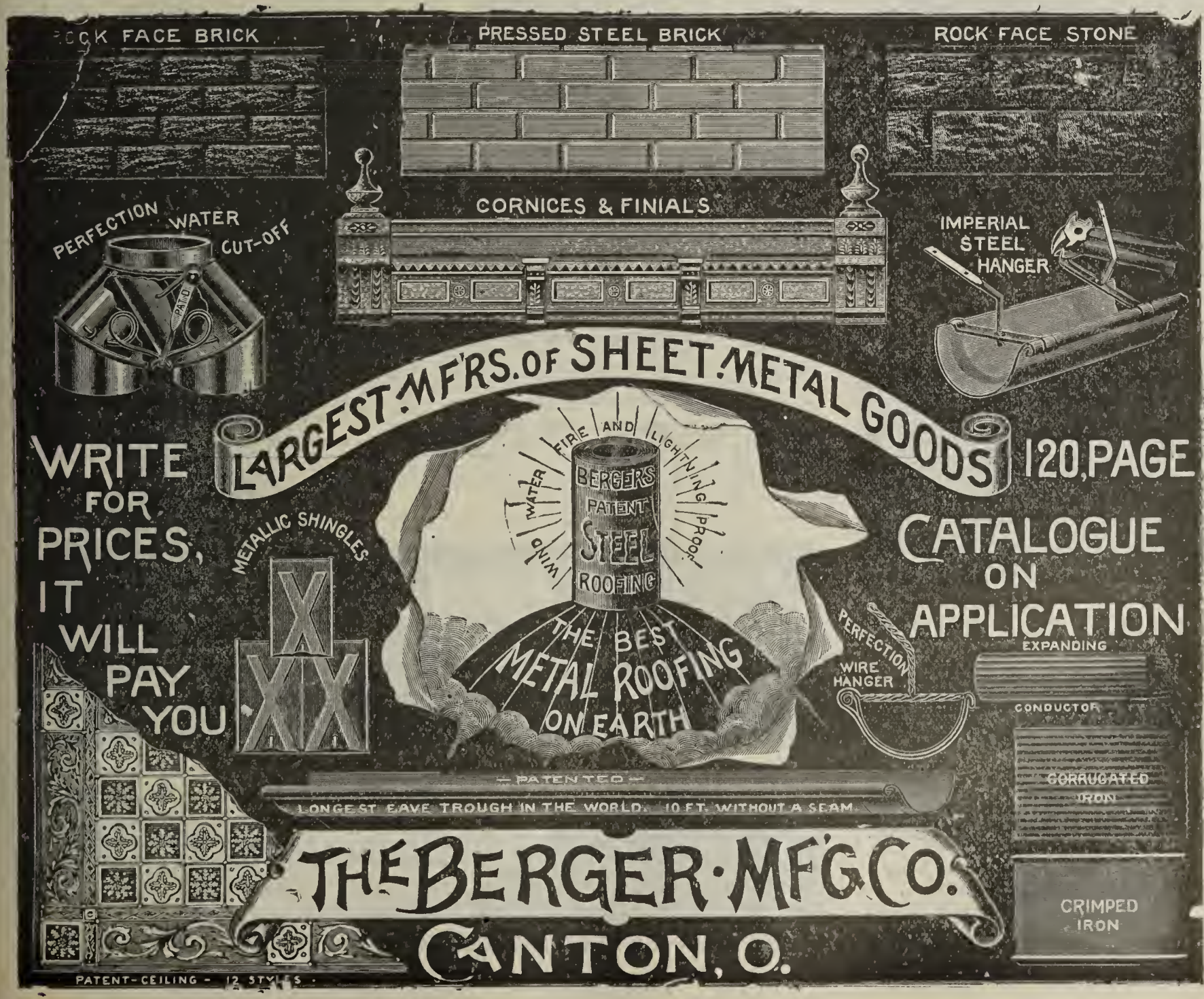
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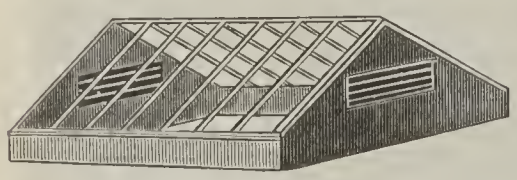
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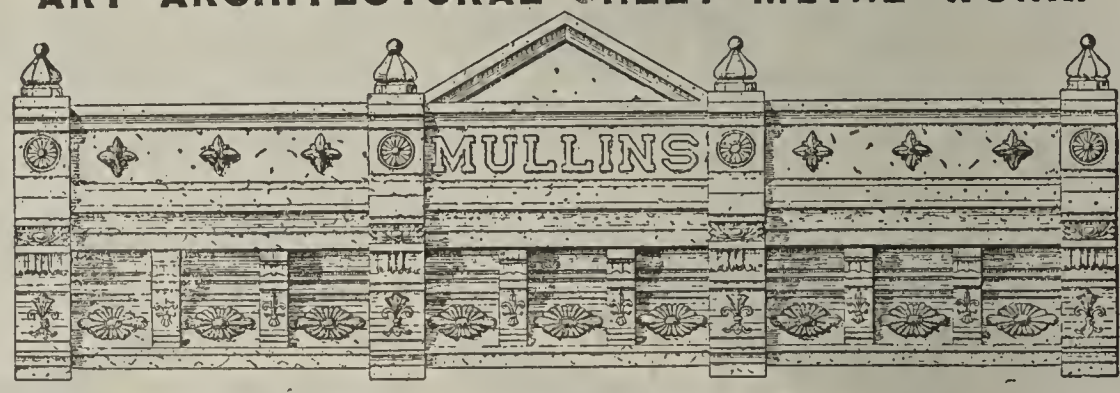
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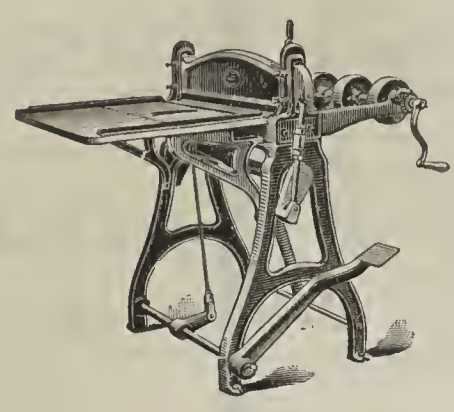
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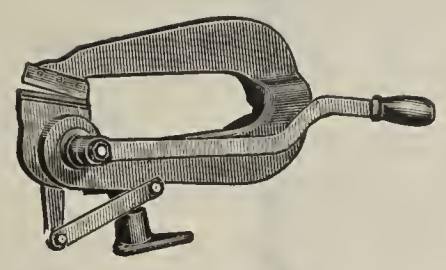
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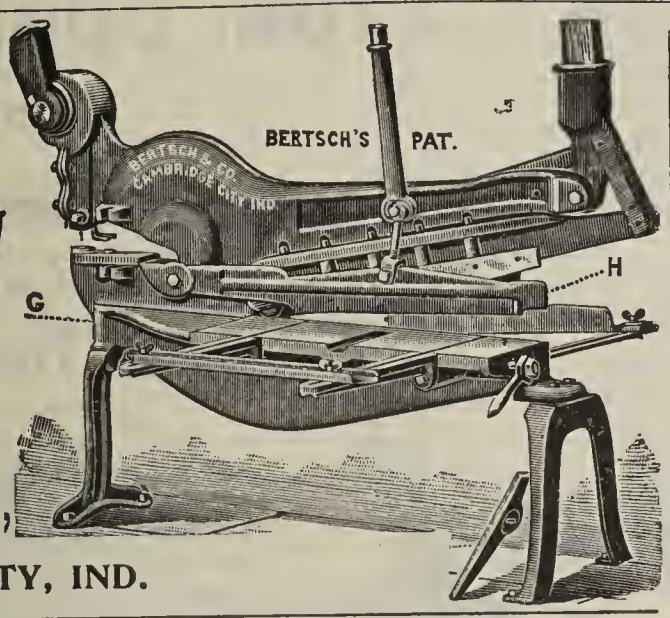
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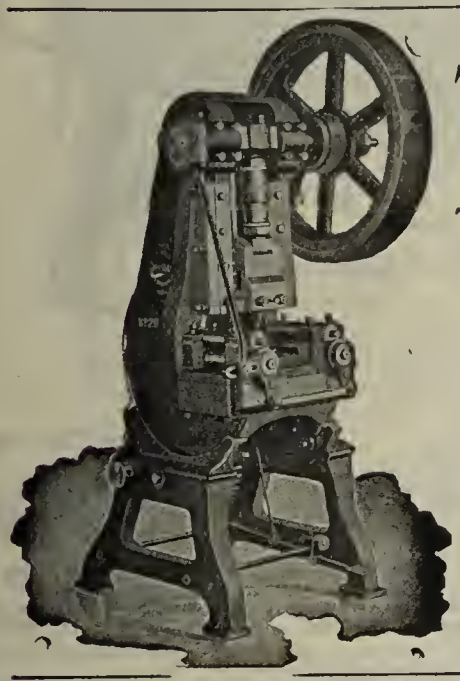


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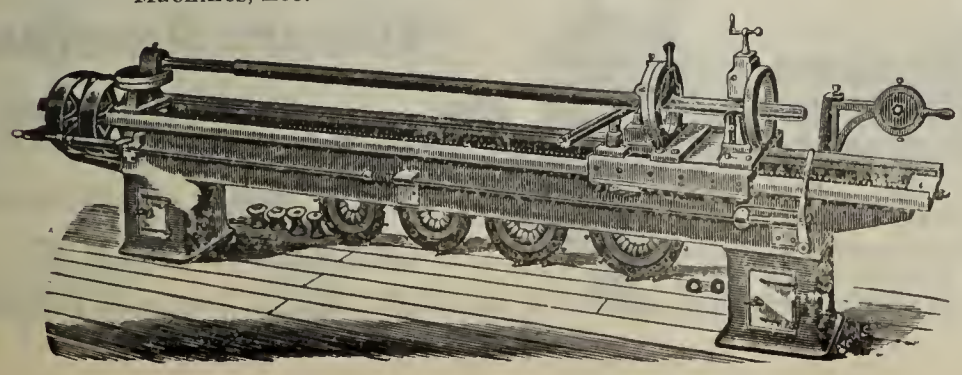
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"I dont know about that."

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"You old loafer, I've a good mind to knock your head off," hissed the red nosed man as he squared off.

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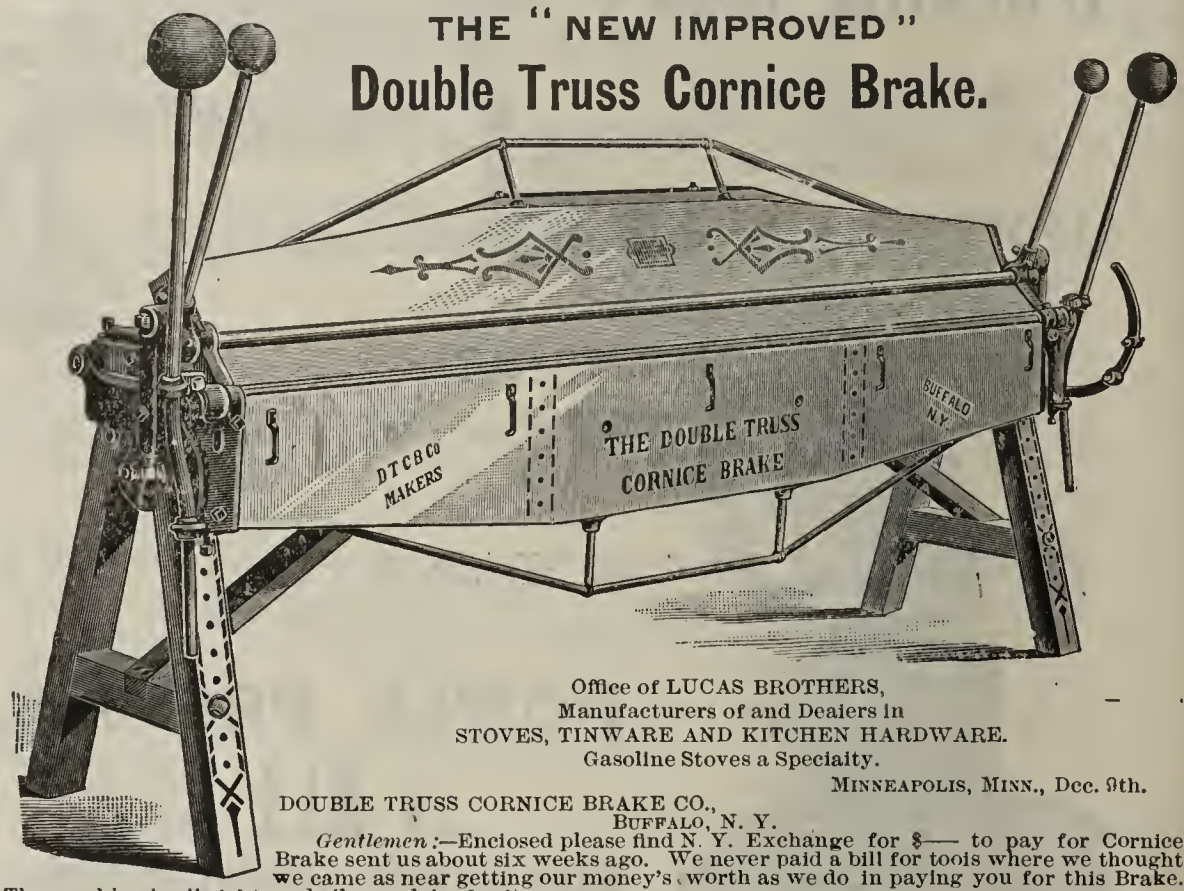
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If you want a good roof, and do not care to use an old style plate, this is the brand you want. It is re-squared, stamped, and carries a 15 pound coating.

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THE "NEW IMPROVED"

Double Truss Cornice Brake.



Office of LUCAS BROTHERS,
Manufacturers of and Dealers in
STOVES, TINWARE AND KITCHEN HARDWARE.
Gasoline Stoves a Specialty.

MINNEAPOLIS, MINN., Dec. 9th.

DOUBLE TRUSS CORNICE BRAKE CO.,
BUFFALO, N. Y.

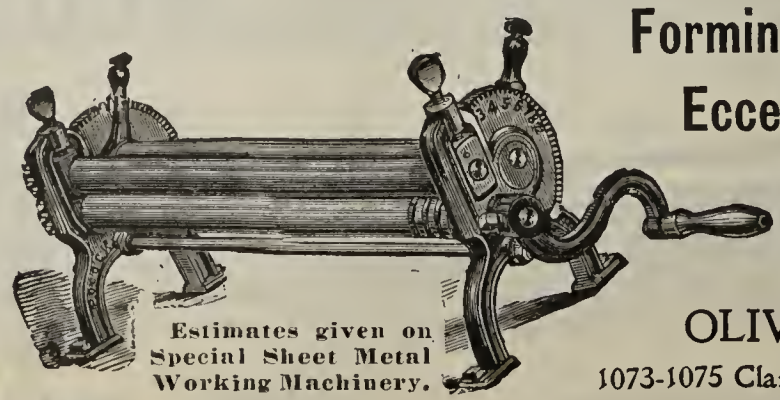
Gentlemen:—Enclosed please find N. Y. Exchange for $—— to pay for Cornice Brake sent us about six weeks ago. We never paid a bill for tools where we thought we came as near getting our money's worth as we do in paying you for this Brake. The machine is all right, and all you claim for it.

The Brake is now in a distant part of this state where our men are putting in a job of large square galv. piping. Should it get in a wreck and be lost to us, we would order another just like it at once.

All the boys in the shop are anxious to know when that Brake is coming back. For our use we would rather have this than an iron one. We are, Very respectfully yours, LUCAS BROTHERS.

All Sizes from 3 ft. to 10 ft. Indispensable to Cornice makers, roofers, tinsmiths, furnace men, etc.
Send for our latest prices.

THE DOUBLE TRUSS CORNICE BRAKE CO., 259 Grant St., Buffalo, N. Y.



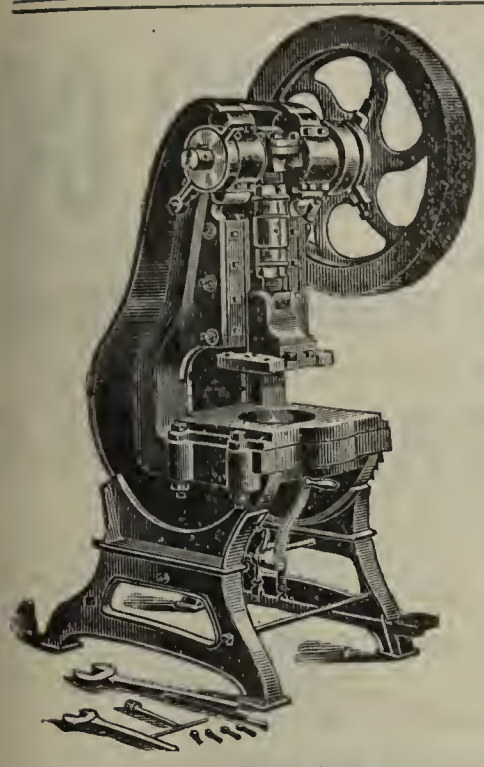
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Forming Rolls, Eccentric Adjustment.

The advantage in using this machine is the quick adjustment of the back roll by means of graduated eccentrics.

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THAT { ***Our New Adjustable Wood Roofing Folder*** does the work of both a 20 and 30 inch improved wood roofing folder and costs you no more than a single one?

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THAT { ***Our No. 7 Combined Bench and Slitting Shear*** has been correctly styled the "handiest machine in the shop?"

THAT { ***Our Catalogue tells you*** all about these and other tools and machines of our manufacture and it is yours for the asking?

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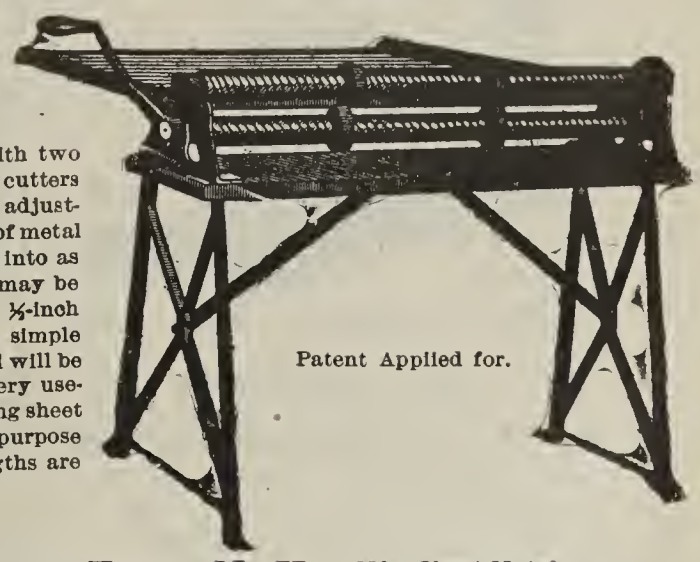
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is adapted to form gutter from 3 inches to 7 inches inclusive. The forming of the bead and gutter is practically a continuous operation. Capacity 600 feet perfectly formed gutter per hour with two ordinary men or boys.

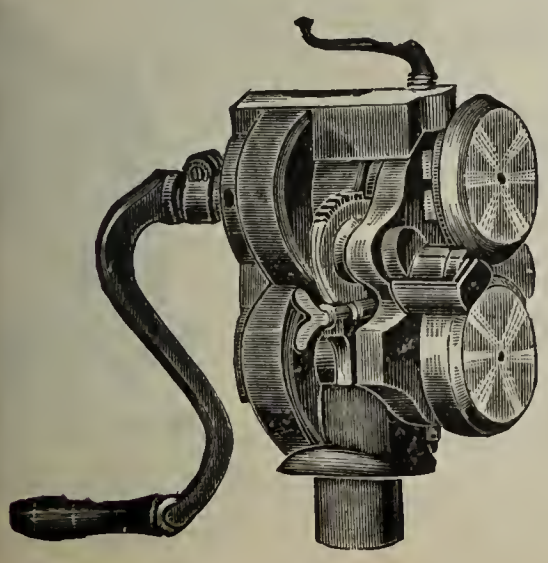
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are provided with two or more pair of cutters which are easily adjusted to cut a sheet of metal 30 inches wide into as many strips as may be desired, from ½-inch and wider; is simple and durable, and will be found to be a very useful tool for slitting sheet metal for any purpose where long lengths are required.



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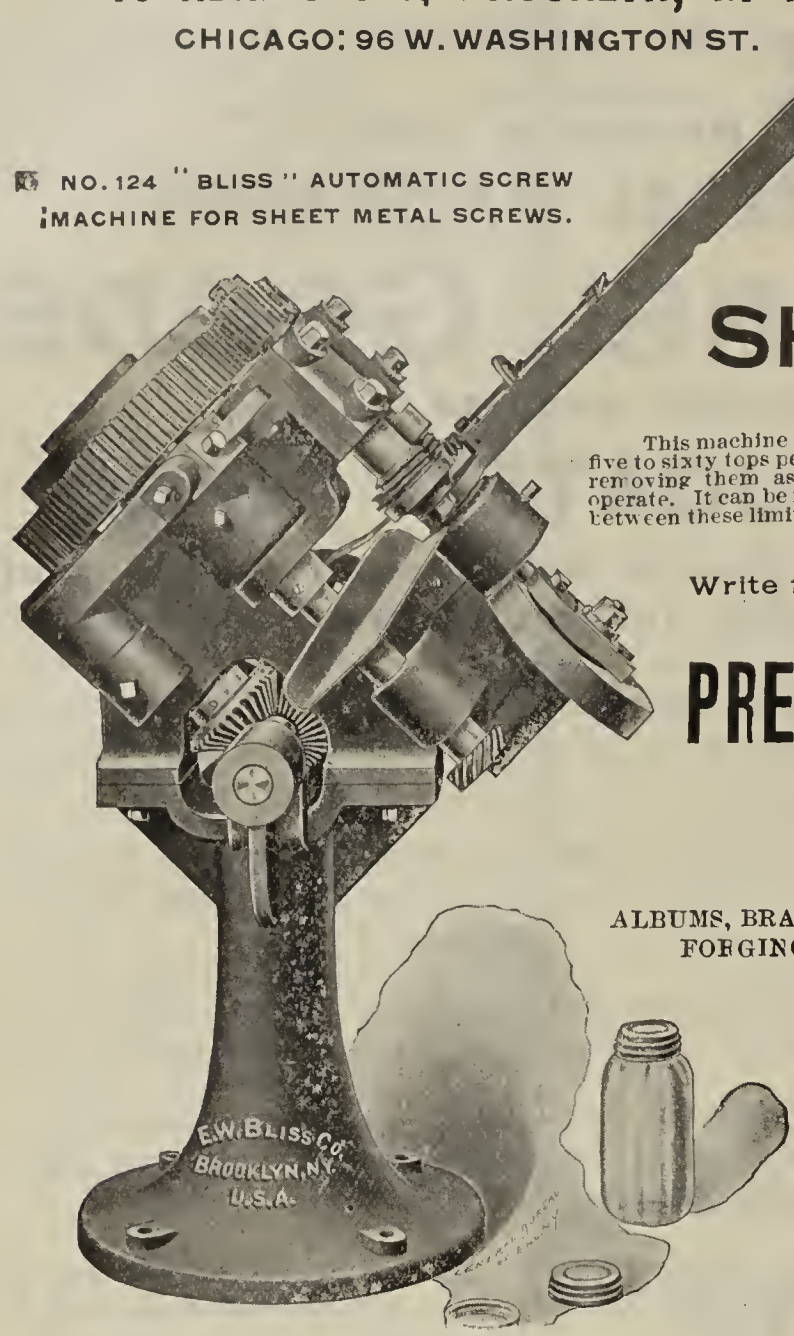
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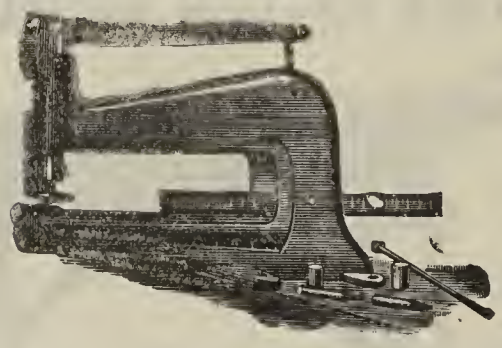
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NEW PROCESS
Eave Trough End Former.

After once using this tool tinners will find that it does not pay to take time to solder the end piece on the Trough. With these tongs you can form an end in two seconds.

Price, $1.00 each.

Circulars sent on application,



By the use of this Former a solid end can be formed on any size trough, single or double beaded, tin or galvanized iron.

Ask your jobber for them, or send direct to
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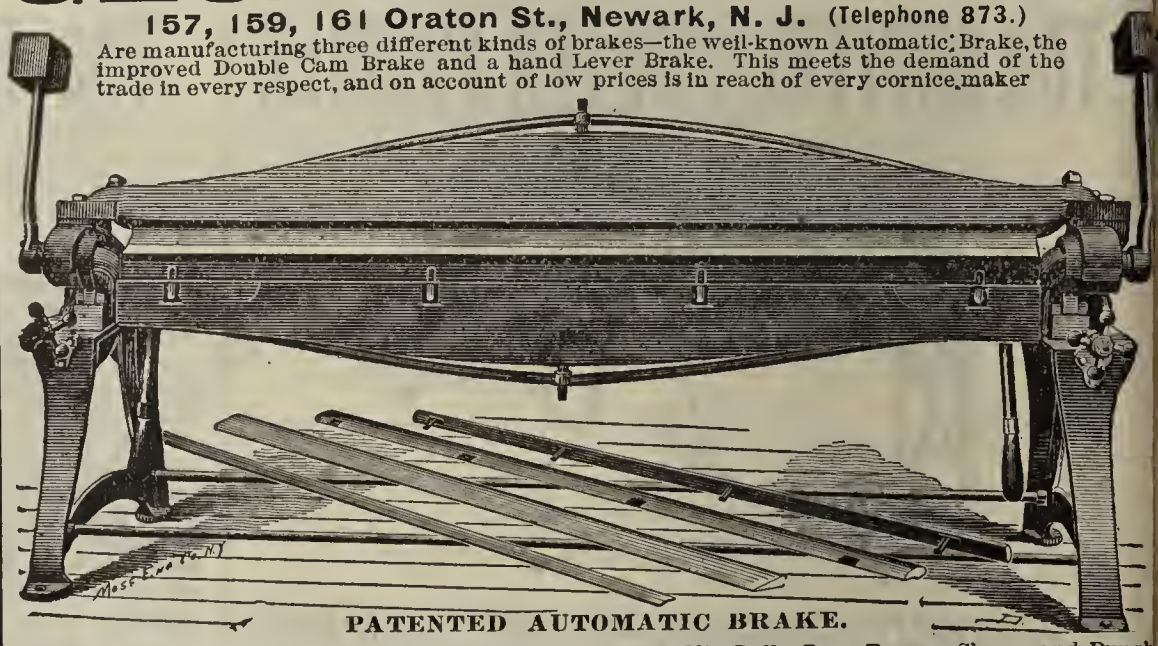
"Oh, they are surrounded by an atmosphere of anxiety. Children would never be sick if it were not for their mothers worrying about them."

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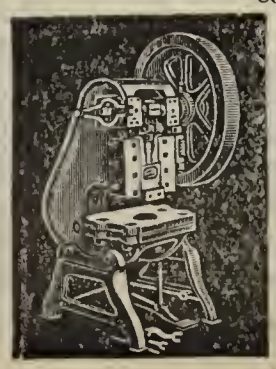
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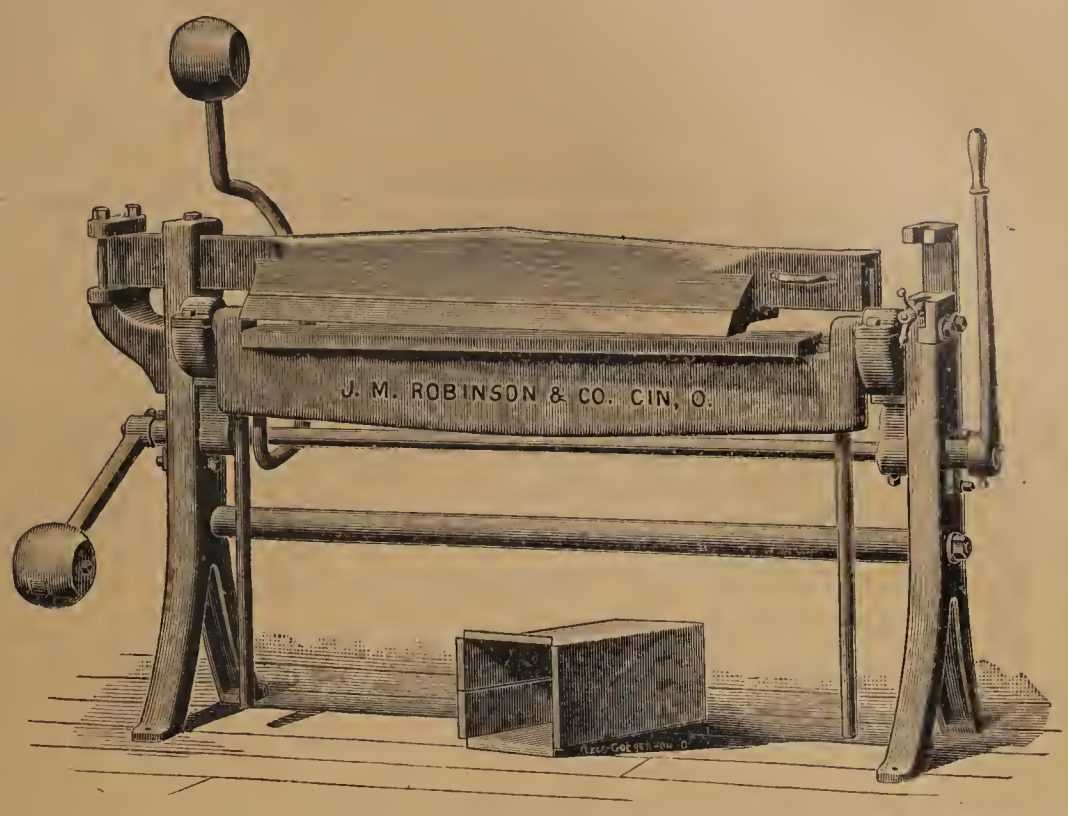
Superior and Oak Streets,

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4 FOOT OPEN END RANGE BRAKE

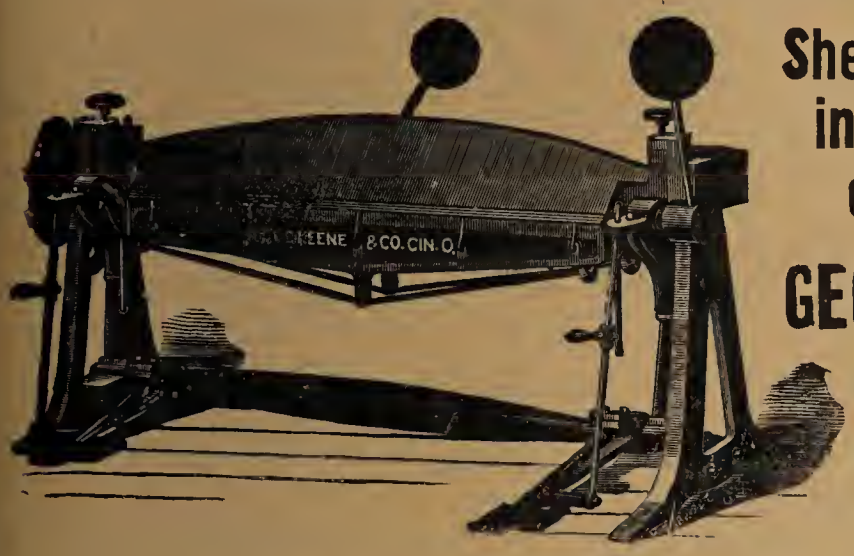
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EASIEST TO OPERATE, STRONGEST AND BEST.



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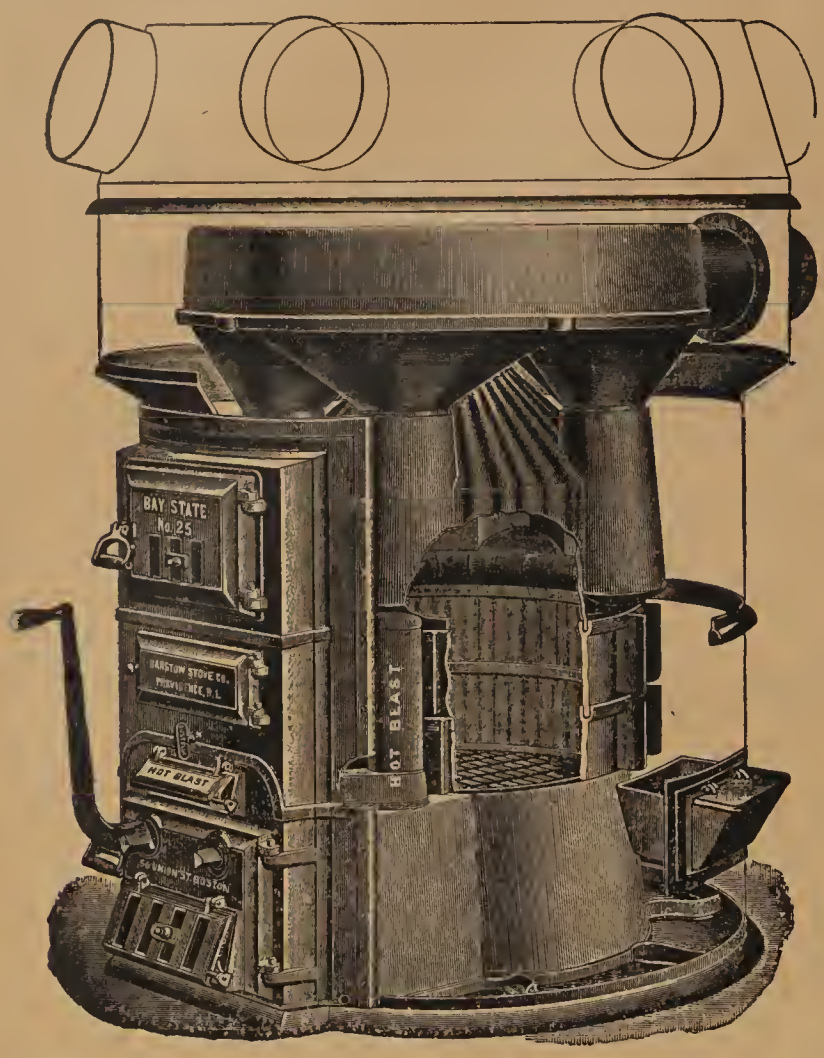
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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

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Two Mills, at least, are trying to pass their iron for
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One pretends that it buys black sheets of us—we
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T'other brands its product "Best Bloom"—two
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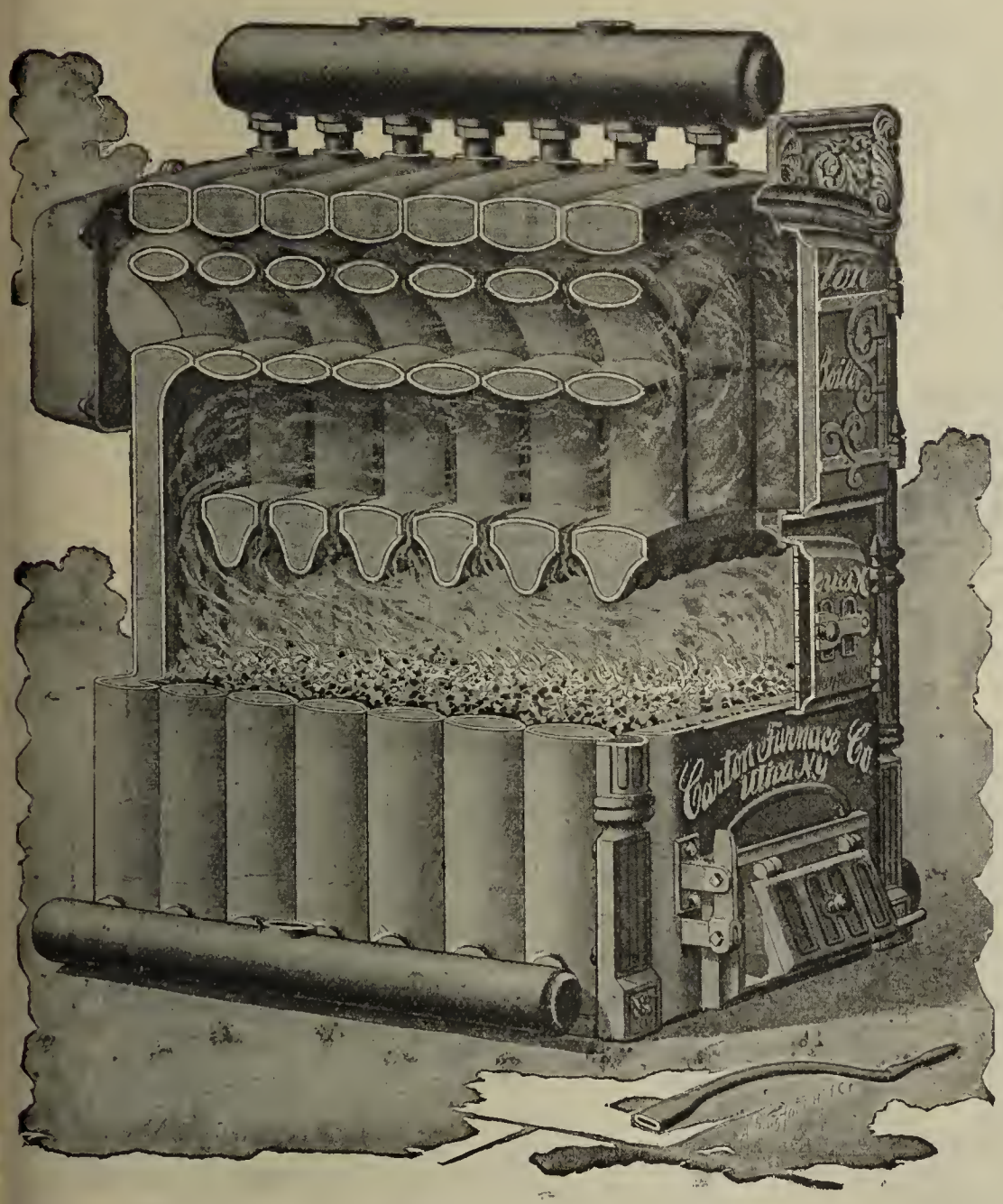
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Hot Water & Steam Boilers & Furnaces.

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The ***Boiler*** is all ***O. K.,*** and ***DON'T FORGET IT.***

Yours, resp'y,
JAMES MURPHY.

Write for our Golden Jubilee Boiler Catalogue.

IF INTERESTED IN HOT AIR FURNACES—WE MAKE A MOST COMPLETE LINE—SEND FOR FURNACE CATALOGUE.

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Warm Air Furnaces (Thirteen Patterns).

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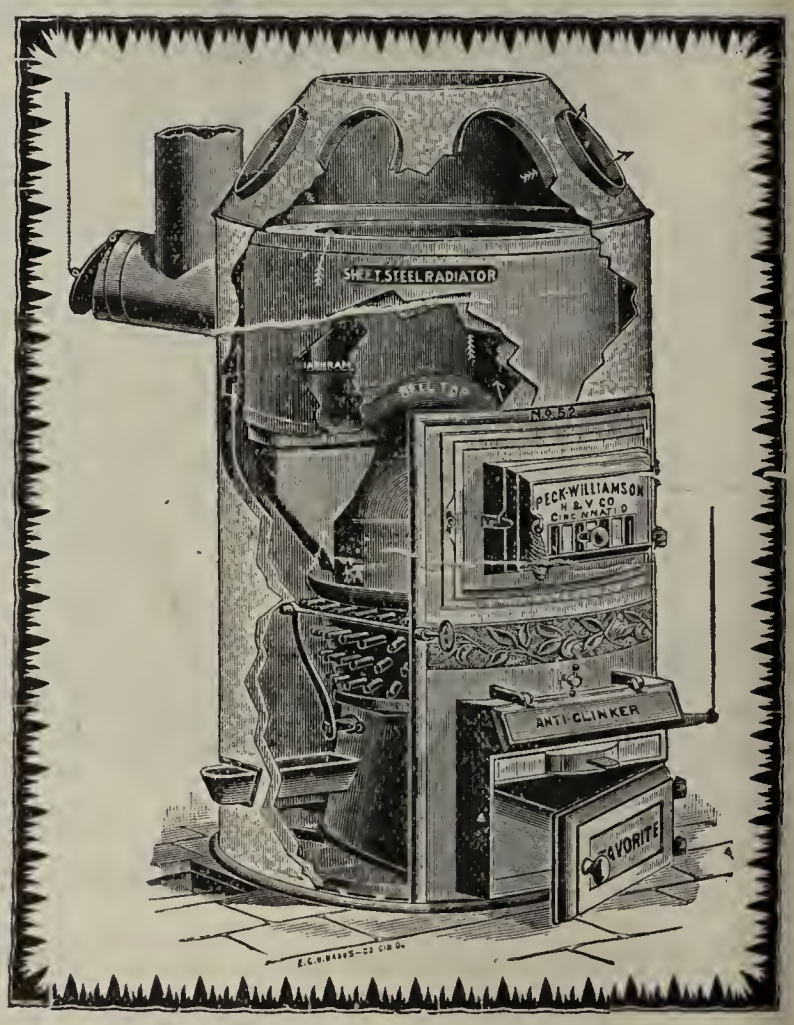
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Without a Defect



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TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.

THERE is money in the heating business if you only handle the right line of goods.

ENOUGH SAID, except that we think it would be to your advantage to investigate our line.

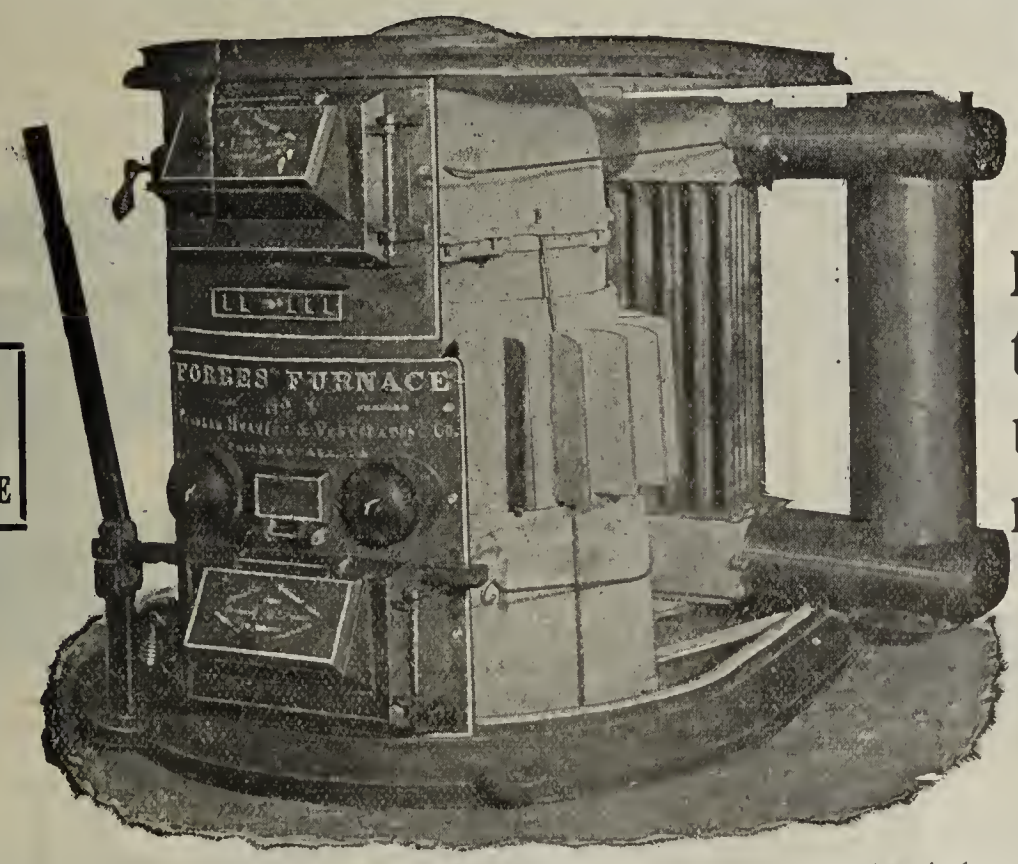
THE FORBES WARM AIR FURNACE.

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REAL ESTATE,
HATBORO, PA.

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PHILADELPHIA.

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Very truly,
I. N. EVANS.



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HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

Only 4 ft. 3 in. High in the Largest Sizes.

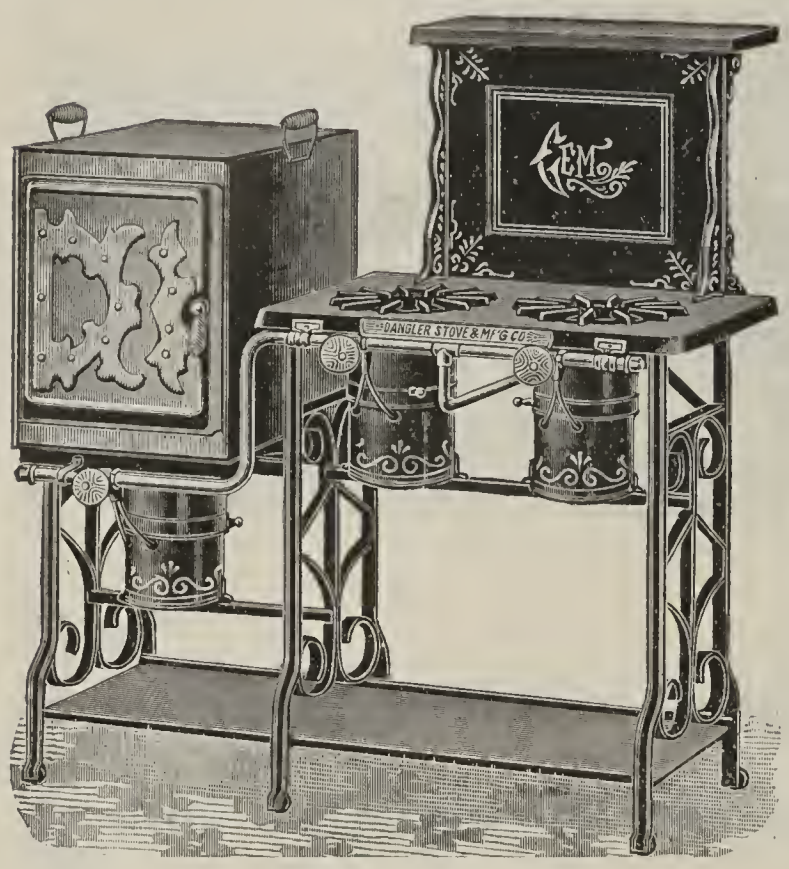
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TUBULAR HEATING AND VENTILATING CO.,
228 QUARRY STREET, PHILADELPHIA.

BLUE FLAME OIL STOVE LEADERS

FOR 1898.

WE LEAD AND OTHERS FOLLOW.



For Durability and Simplicity our Blue Flame Wick and Wickless Stoves are recognized as the best in the market.



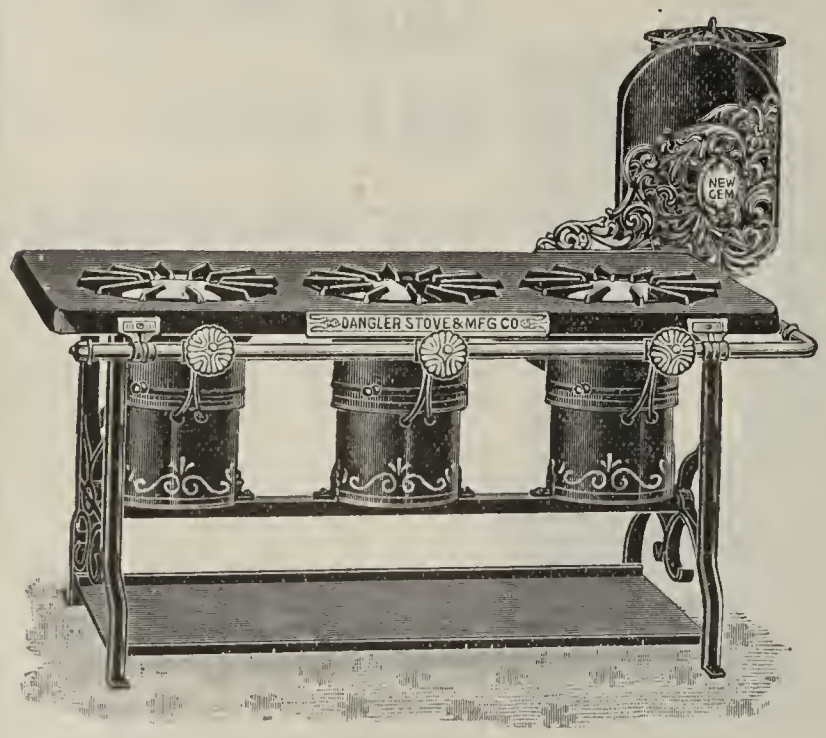
WICKLESS.

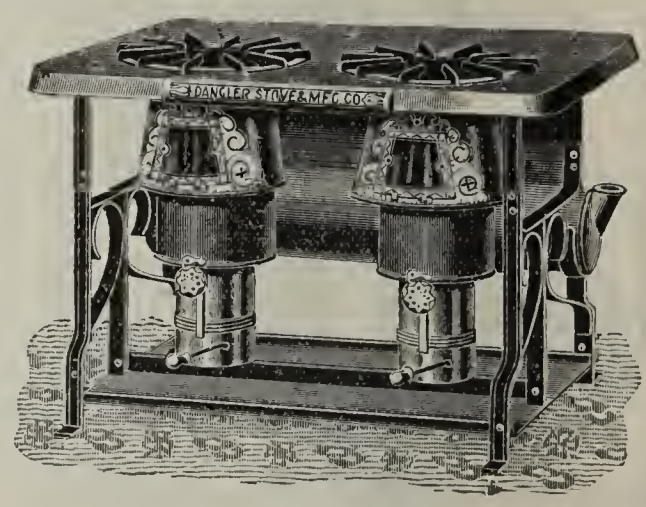
Made in seven different styles. Convenient in construction; economical in the consumption of oil; made with our Double Feed; German Silver points; no rusting or clogging; with valve-stop and regulator; heavy brass chimneys. Made for service and not for show. High back swinging shelf; removable tank; stove on rollers; easy to operate and to clean.

A STOVE FOR THE PEOPLE.

WICK.

Our celebrated Blue Flame Wick Stoves are made in seven different styles, and are now in use in more than fifty thousand households in the United States, who bear willing testimony to their great merits. Artistic in design, handsome in appearance, and powerful in operation.





Our line of Gasoline Vapor and Evaporating Ranges, Stoves, etc., as usual. is perfect and complete. Send for Catalogue.

THE DANGLER STOVE & MFG. CO., - Cleveland, Ohio.

DO NOT SPECULATE

IN

Cheap or Experimental

LINES OF

Vapor or Oil Cooking Stoves.



The average mortal has troubles enough of his own without buying those of his neighbor.

Speculation in any of the above mentioned lines will drain your purse and put you to a world of trouble.

Seeds of prudence now well sown in the selection of a line that is both complete and honest will yield a profitable and happy harvest. A good beginning for 1898 means half the battle won.

If you are interested in the handsomest line made, write for our catalogue.

EXCLUSIVE AGENCIES GIVEN.

THE SCHNEIDER & TRENKAMP CO.,

CHICAGO, ILLINOIS. CLEVELAND, OHIO.

"New Process" Cabinet.



Made in two styles, with and without step.

WE OFFER

The Largest Variety
OF STYLES,
The Handsomest
IN DESIGN AND FINISH,
The Best
IN CONSTRUCTION AND OPERATION,
IN EVERY LINE OF

"NEW PROCESS" STOVES.

Globe Junior Gasoline Stoves.

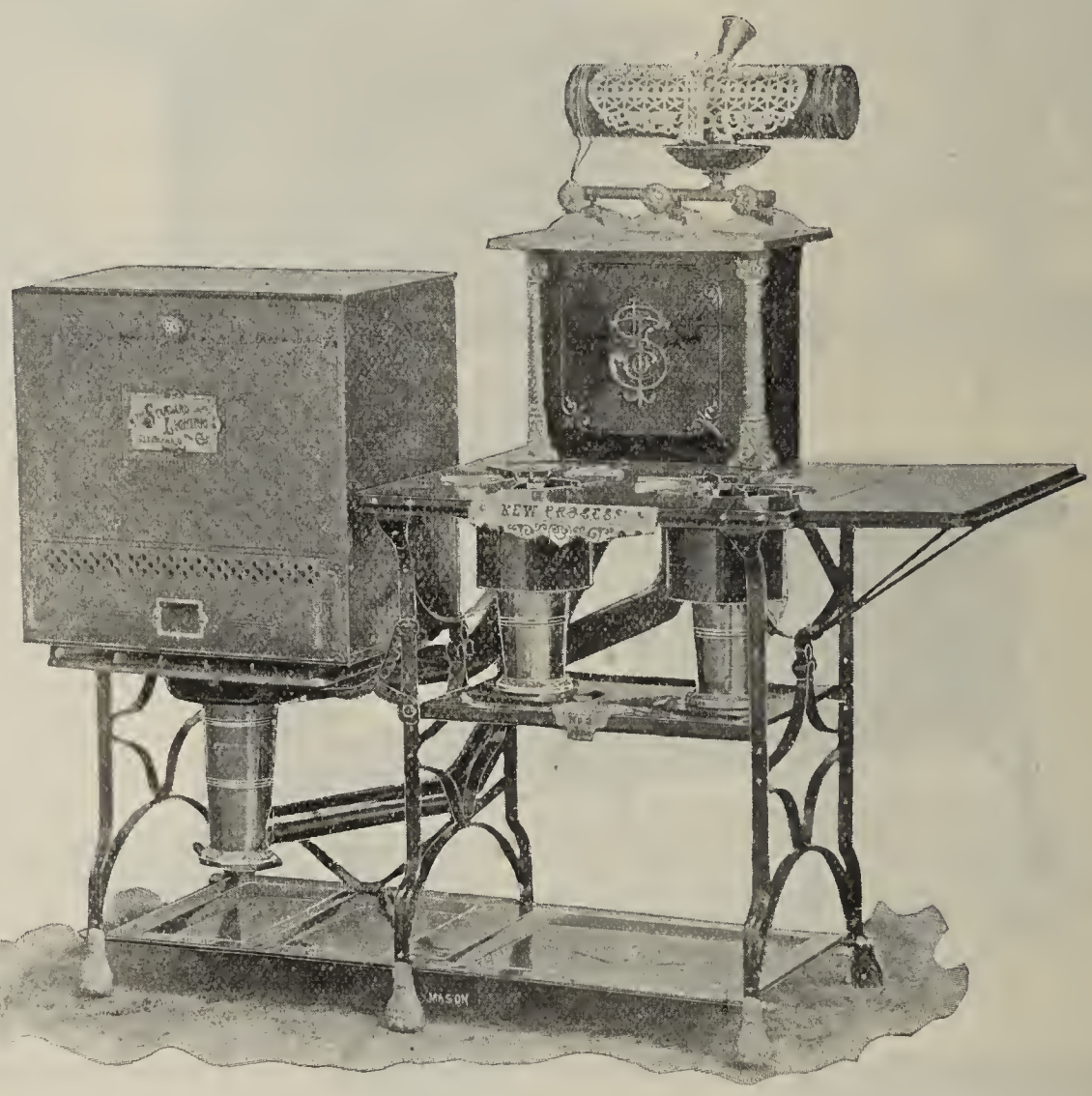


12 styles and sizes, with and without safety tank.

We have Juniors to suit everybody.

"New Process" Gas Stoves, "New Process" Gasoline Stoves, "New Process" Oil Stoves.

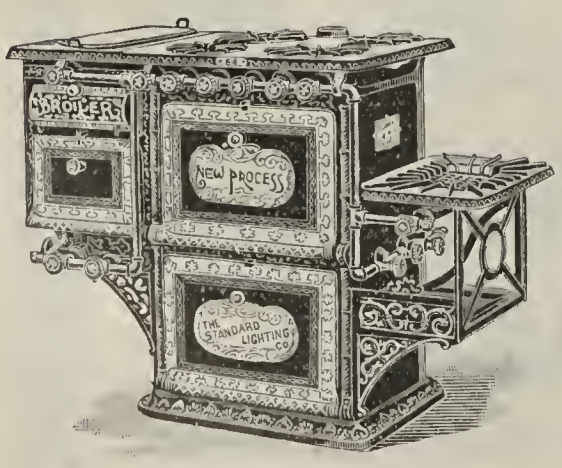
You cannot make a mistake in buying any of the "New Process" lines.



"New Process" Gasoline Stove. Made in 6 styles and sizes.

Every Stove Guaranteed. Make your selection and order samples. If we can secure your sample order we are sure of your trade.

"New Process" Gas Range.
(With Reflex Oven.)



Made in 252 styles and sizes, for any kind of gas.
Special Catalogue.

The Standard Lighting Co.,

CLEVELAND, OHIO.

Eastern Jobbers who sell "New Process" Stoves:

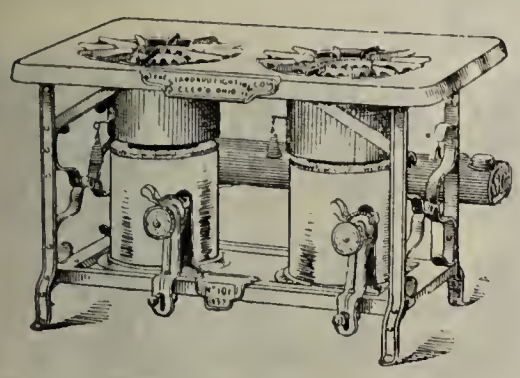
The S. M. Howes Co., Boston, Mass.
F. M. Borden & Bro., Philadelphia, Pa..
Eugene Munsell & Co., New York, N. Y.
Geo. W. Stevenson & Bro., Pittsburg, Pa.
The F. H. Lawson Co., Cincinnati, Ohio.
The Thos. Davidson Mfg. Co., Ltd., Montreal, Quebec, Canada.

Bell Junior Gasoline Stove with Giant Burner.



Made in 6 styles and sizes.
A First-Class Generating Stove.

"New Process" Blue Flame Oil Junior.



Made in 1, 2 and 3 Burner. Same burners as on large stoves.

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Will come in 1898 to the Dealer who sails under the banner of . .

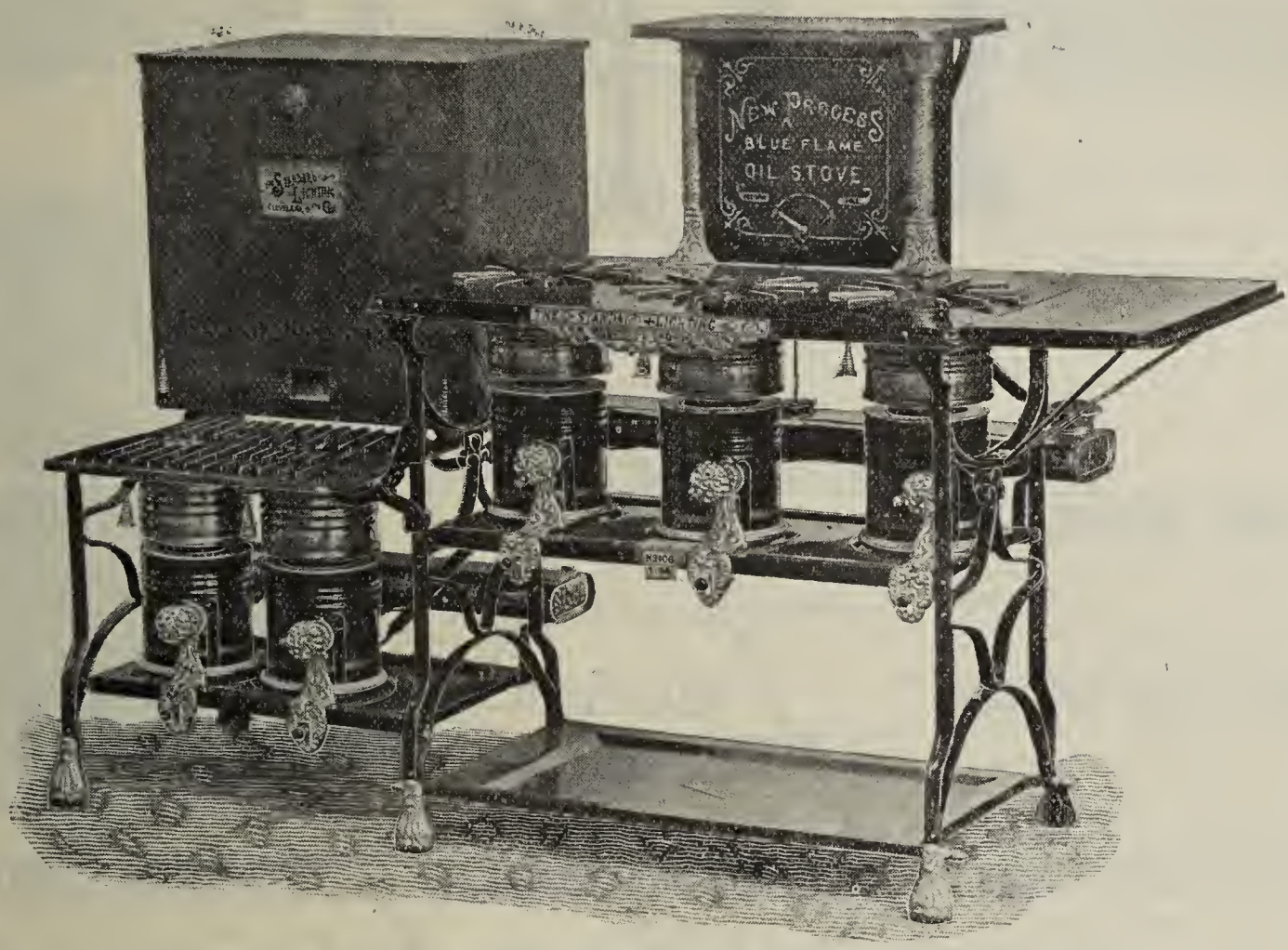
"NEW PROCESS" STOVES.

"New Process" Oil Heater.



The Only One.

They are Very Attractive, Operate Perfectly and are sure to be Great Sellers.



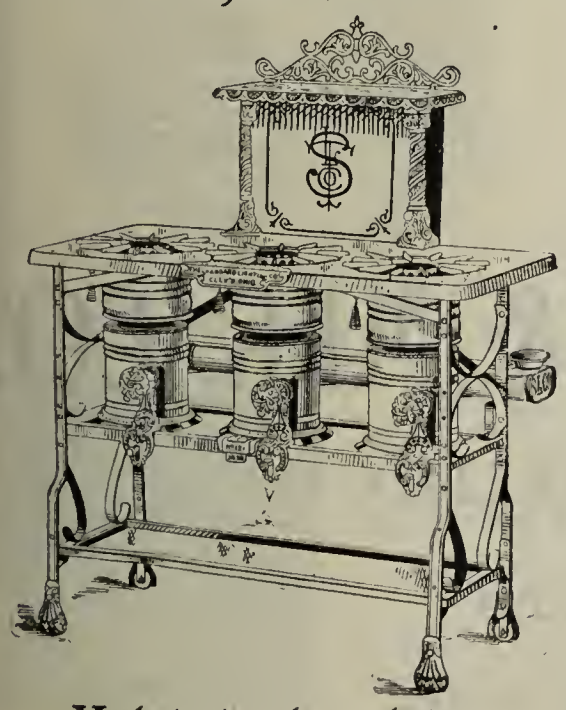
"New Process" Blue Flame Oil Stove. Made in 14 styles and sizes.

All our Blue Flame Stoves have Brass Burner Drums.

The Chimneys are Aluminum Bronze and will not rust or burn out

If you haven't our catalogues write for them.

"New Process" Blue Flame High Junior.



Made in 4 styles and sizes.

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CLEVELAND, OHIO.

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Townley Metal Co , Kansas City, Mo
Knapp & Spalding Co., Sioux City, Iowa.
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Kellogg & Stokes, Denver, Colorado.
Holbrook, Merrill & Stetson, San Francisco, California.
The O. K. Stove & Range Co., Louisville, Ky.
The Phillips & Buttorff Mfg. Co., Nashville, Tenn.
The T. B. Rayl Co., Detroit, Mich.
Morley Bros., Saginaw, Mich.
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Brass Burner Drums. Aluminum Bronze Chimneys.

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"New Method"

"Smokeless Giant Generator"

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"Asbestos Filled Oven"

BEAUTIFUL NEW CATALOGUE NOW READY. GET 1

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THE MONARCH STOVE & MFG. CO.,

MANSFIELD, OHIO.

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STEEL RANGE

WITHOUT A PEER.



TWO SERIES, { Series A.—Medium Price. Series B.—Low Price.

SIX SIZES, . . . { 16 x 20 18 x 20 20 x 20 16 x 22 18 x 22 20 x 22

ALL STYLES, { Write for Steel Range Catalogue No. 14.

ALSO a complete line of Cast Ranges, Cooks and Heaters. Catalogue No. 15.

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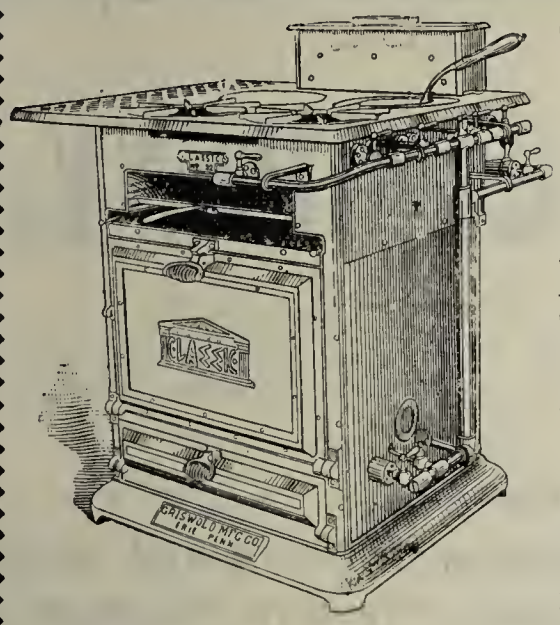


Ranges, Hot-Air Furnaces, Fire-Place Heaters, Cook Stoves, Heating Stoves, &c.

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BALTIMORE, MD.

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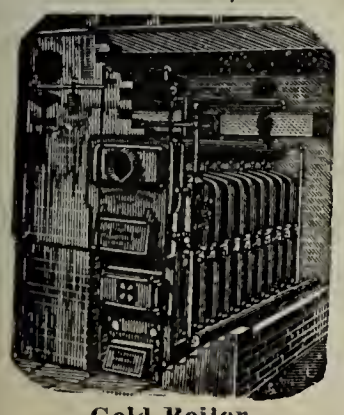


The most economical gas stove made. Neat and simple in design and easily kept clean. They sell themselves.

Manufacturers of the most Complete Line of Extra Finished Hollow Ware and "Cast" Aluminum Ware, Waffle Irons, Broilers and Griddles especially adapted for Gas and Oil Stoves.

A Full Line of Summer Stoves and Hot Plates.

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New York Warerooms, 294 Pearl St.


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FOR PUBLIC AND PRIVATE RESIDENCES.

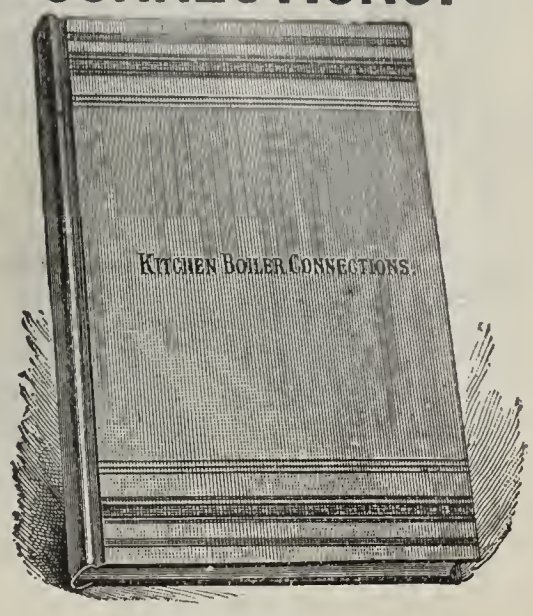
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Radiators: Union, Royal Union, Champion, Imperial.
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Send for Circular. FOUNDRY, WESTFIELD, MASS.

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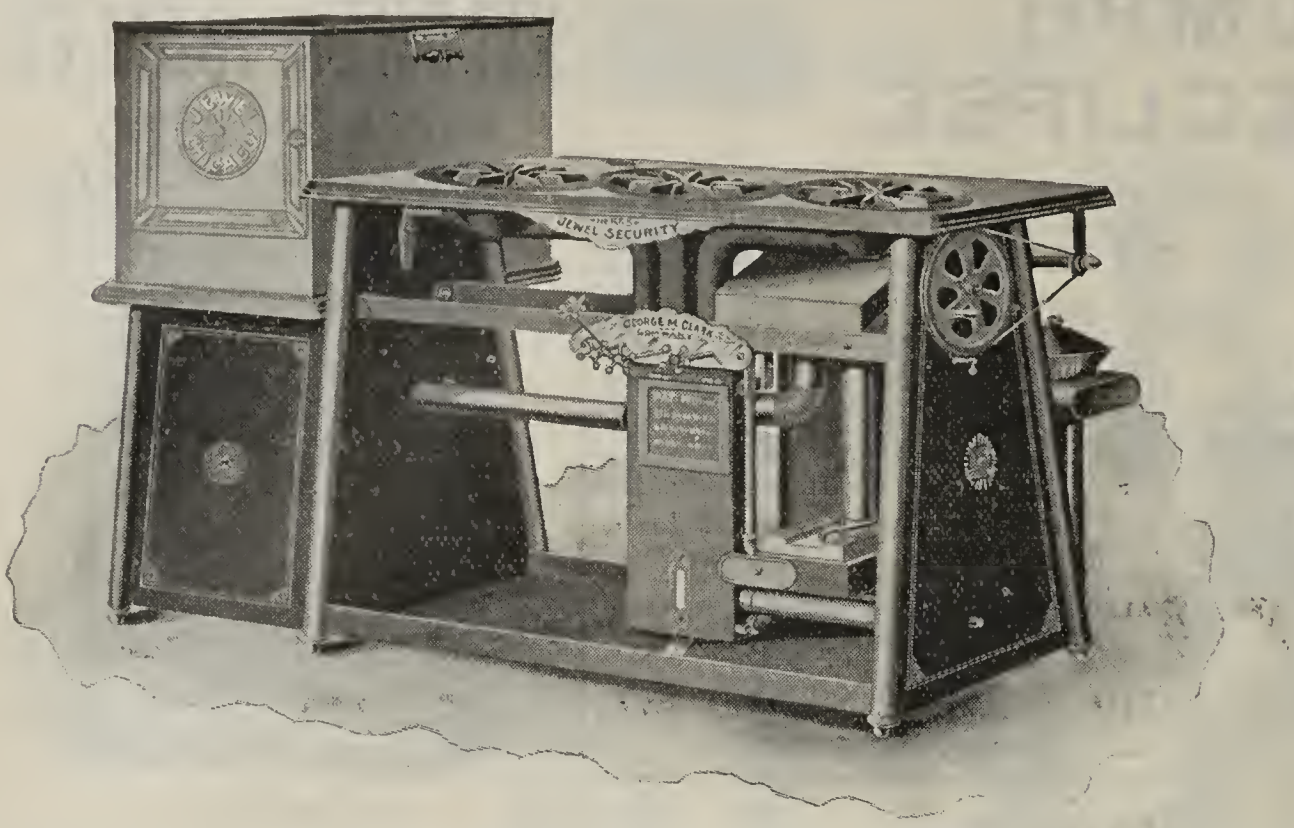
The Metal Worker produces in this volume a number of queries, with answers thereto, which have appeared in that paper. It will be seen that *any plumber who is troubled to make boilers work satisfactorily will here find his troubles alleviated. It contains numerous illustrations and throughout is highly practical from the standpoint of the plumber.* It contains a table of contents and an index.—*Scientific American.*

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No. 545, WITH END DOOR RUSSIA OVEN.
THREE BURNERS ON TOP AND SIMMERING BURNER.
TWO BURNERS ON STEP.

DIRECTIONS FOR LIGHTING:

These Absolu
will assure th
make Satisfi
the most co

Not a Dro
can

Turn the Wheel a
Match at the Door i
as are needed.

Every Line of Advertising a
will bring Dollars Strai

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The Exclusive Agency for Jewel Security Stoves means your gaining a profitable business with no competition to filch it from you.

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y Safe Stoves
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Customers of
vative.

of Gasolene
cape.



Right Hand End of the Stove for 30 seconds, First Applying a Lighted
Generator Casing, then open the Valves and light as many Burners

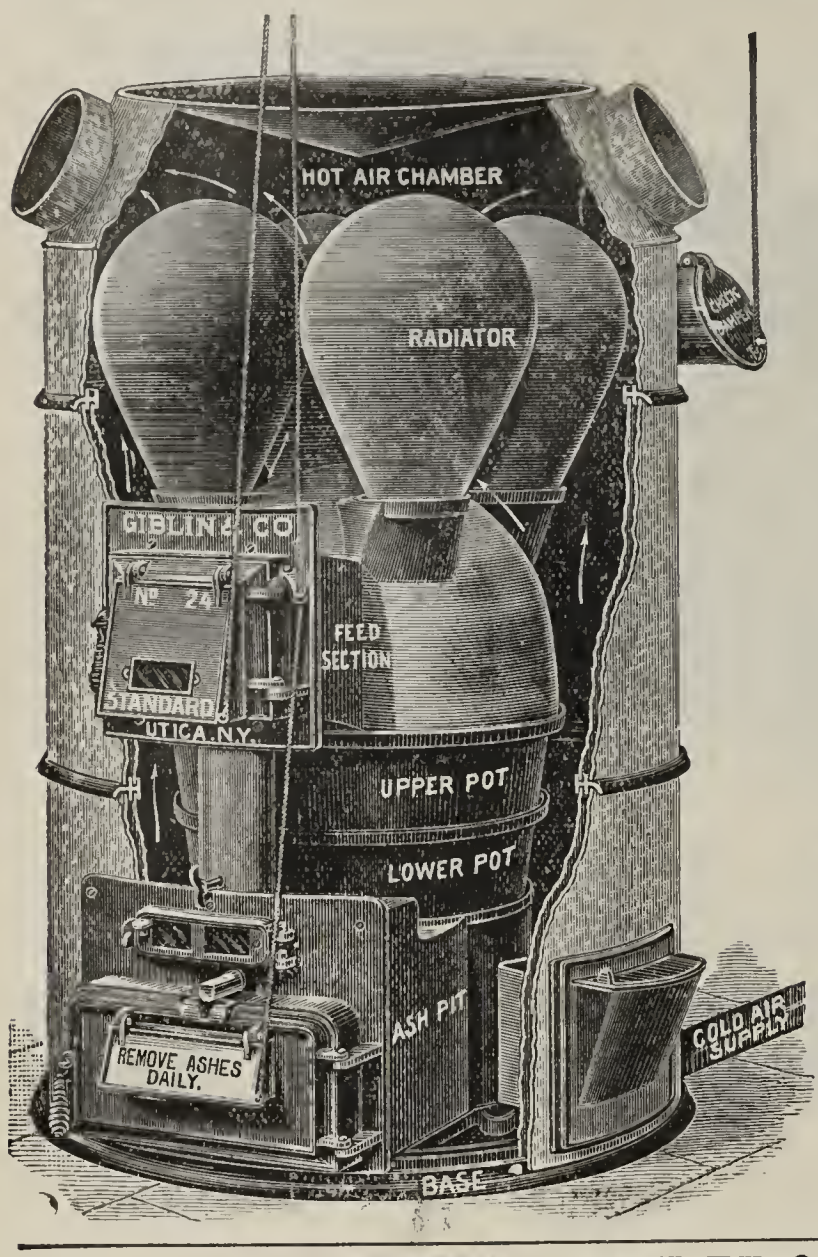
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t into your own Pocket.

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HIGH GRADE HEATERS.

ANYTHING

that will hold a fire can be called a furnace, and to inexperienced persons may pass as a furnace.

ACTUAL

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FAILED

to fill the requirements for burning soft coal, and in the furnace illustrated here we have secured features that have rendered the burning of soft coal a certainty. It uses this fuel without

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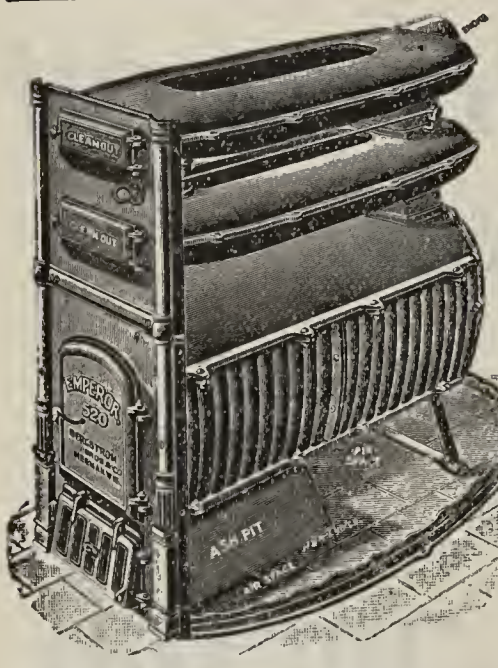
and without damage to the castings. With this furnace soft coal can be used with as little discomfort as if hard coal were used.

OUR CATALOG

explains more fully, and dealers who want to develop a good business this year in soft coal sections can render their success certain by handling this furnace.

GIBLIN & CO.,

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EMPEROR FURNACES

FOR WOOD.

Simple, Safe, Durable.

ECONOMICAL IN FUEL.

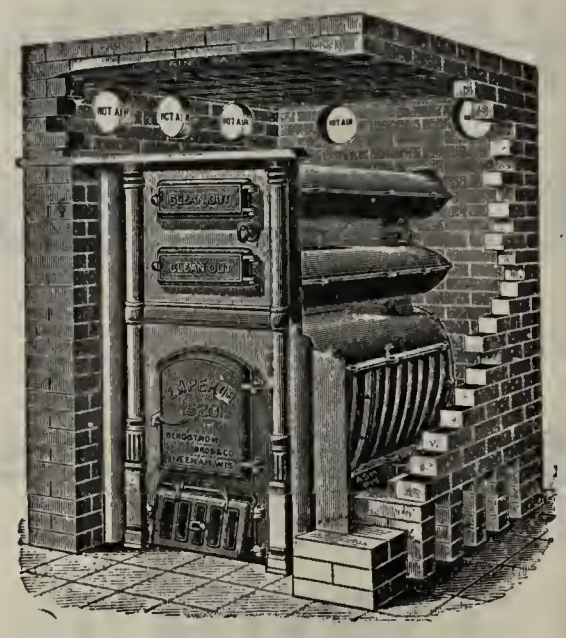
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Blue Flame, 2 styles; ***Circular Burner Oil Cook Stoves,*** 3 styles; ***Hot Plates,*** 10 styles; ***Gas Ranges,*** 2 styles (7 sizes); ***Gas Cookers,*** 4 styles (4 sizes), and a full and complete line of ***Tin Oil Stoves, Lamp Stoves, Tailor and Laundry Stoves,*** etc., etc.

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HART & CROUSE CO.

Royal Heaters.

ALL KINDS OF HEATING APPARATUS.

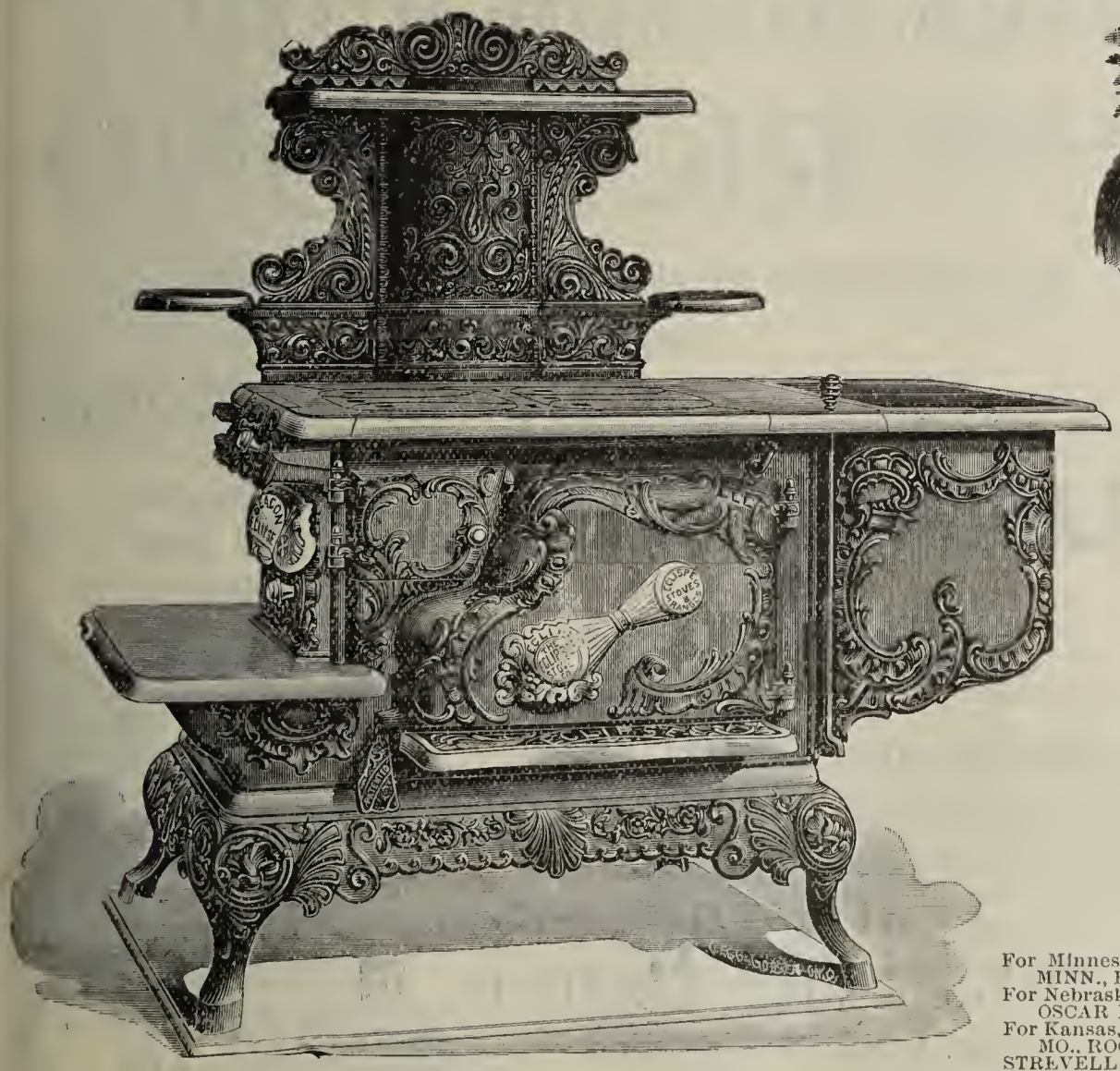
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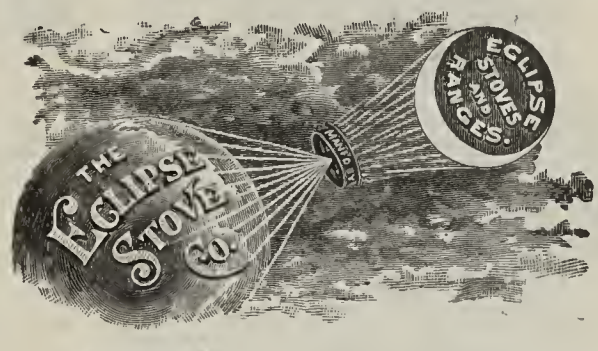
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All Styles.

A Strictly High Grade Up-to-date Range.

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STREVELL HDW. CO., Agents for State of UTAH.

See our Steel Range Adv. on Page 11.

In 1898—WATCH the "ECLIPSE"—In 1898.

THE UNEXPECTED OFTEN HAPPENS.

You did not *expect* that *furnace trade* would *increase* in spite of hot water and steam.
BUT IT HAS!

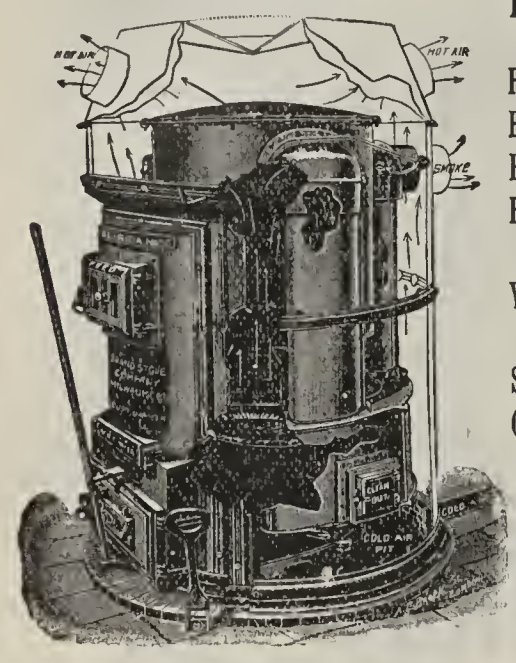
You did not *expect* to find our *variety* of *furnace sizes and styles* so great.
BUT IT IS!

You did not *expect* to get such *well made* and *substantial furnaces* at such *fair prices*.
BUT YOU CAN!

If you *doubt* it give us a chance to *prove it.*

GRAFF & CO., 208 Water St., New York.

THE FAMOUS FLORIDA.
FOR COAL.



Brand's Famous Furnaces.

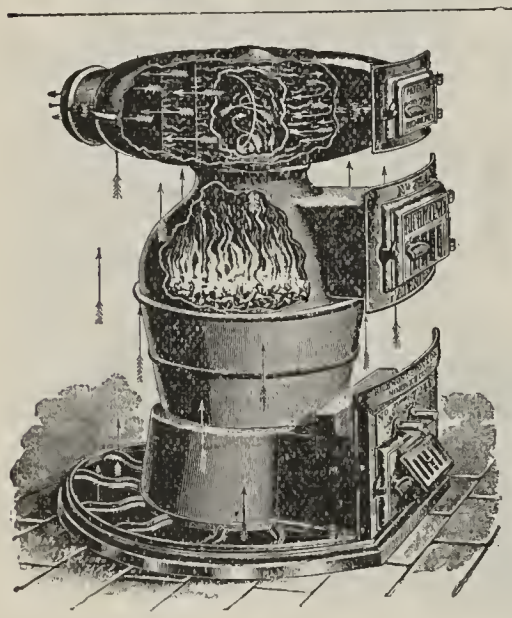
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Heavy Fire Pot.
Revolving or Flat Grates.
Very Large Ash Pit Door.
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Gas and Dust Proof.
Efficiency in Heating.
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Durability Unsurpassed
Made in 3 Sizes.
38-50-60 Inch Fire Boxes.

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MILWAUKEE. CHICAGO.

THE FAMOUS MAGNET.
FOR WOOD.





The Richmond Stove Company

make all kinds of

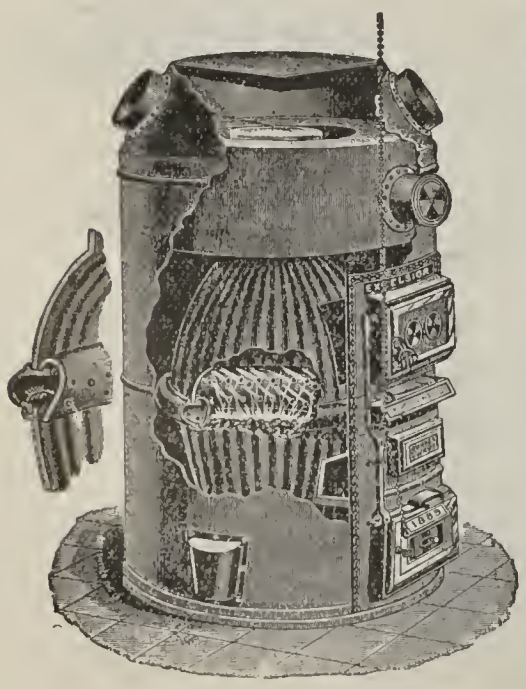
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FURNACES
AND
FITTINGS.

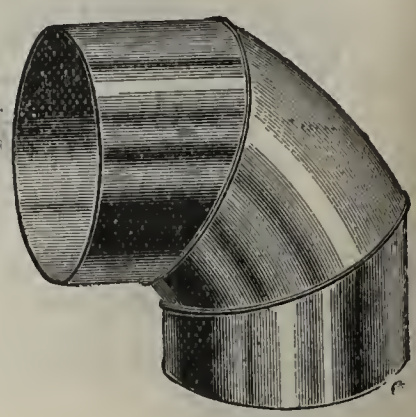
ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
AT ATTRACTIVE PRICES.

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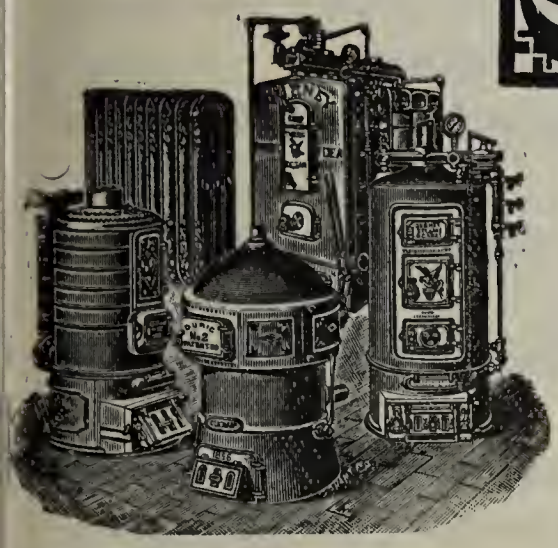
See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



of Furnace Pipes and Fittings.

1898 **Gurney** 1898

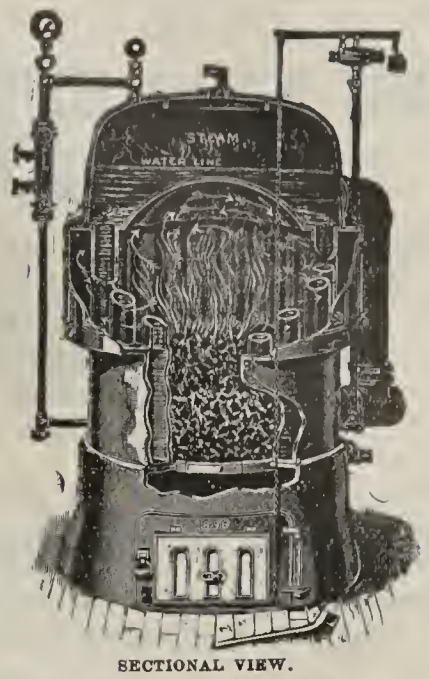


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THE STANDARD OF THE WORLD.
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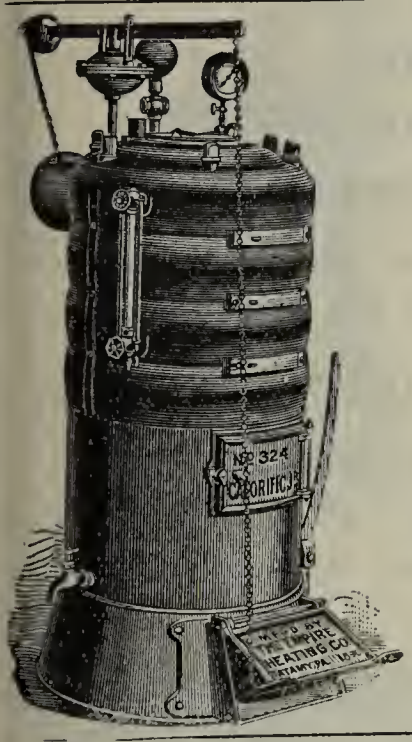
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THE PLUMMER BRICK SET **STEAM HEATER,** NEW MODEL.

THE **LEADER** HOT WATER HEATER.

Made in our own plant. Send for Catalogue.

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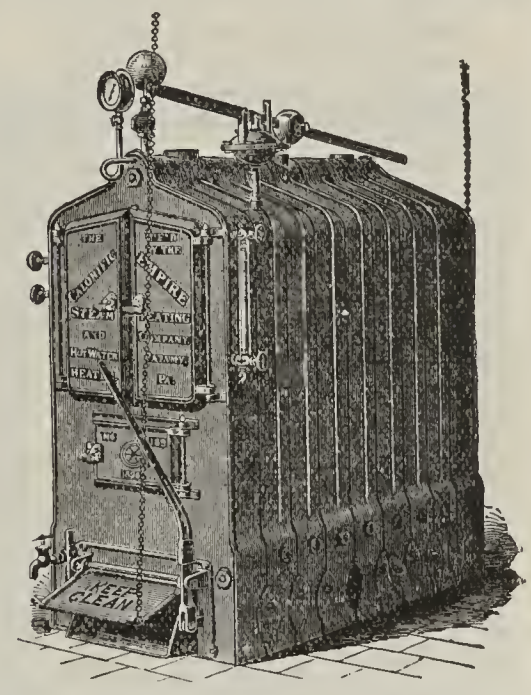
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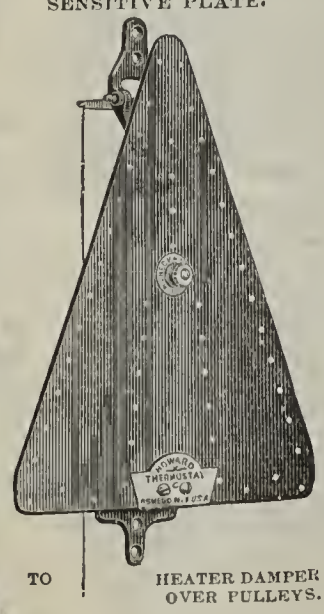


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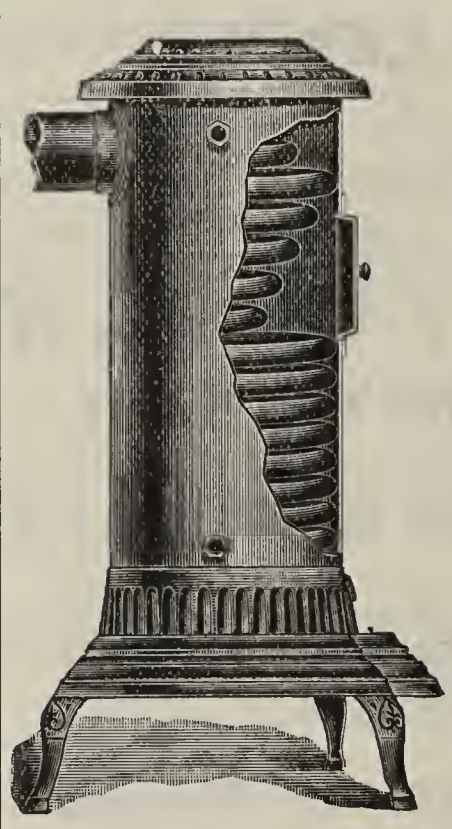
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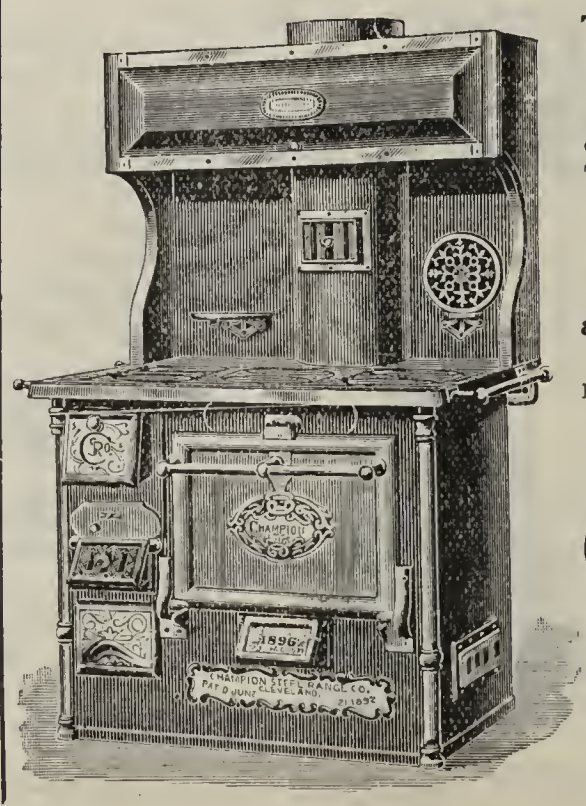
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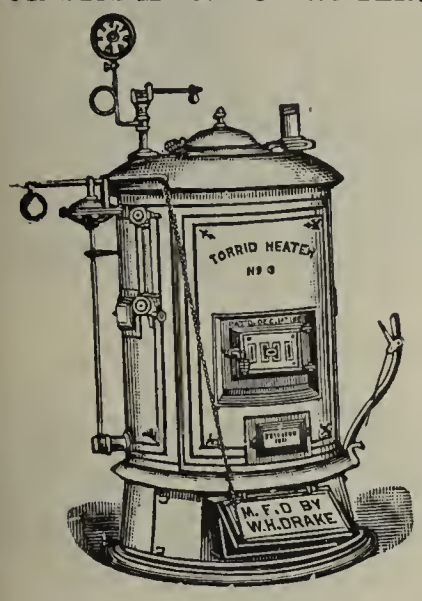
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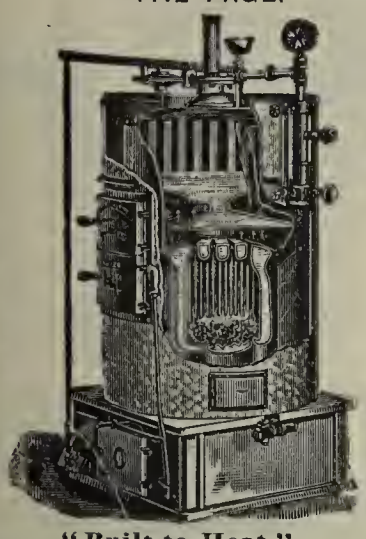


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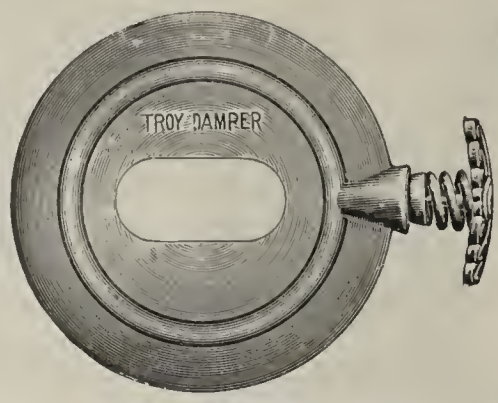


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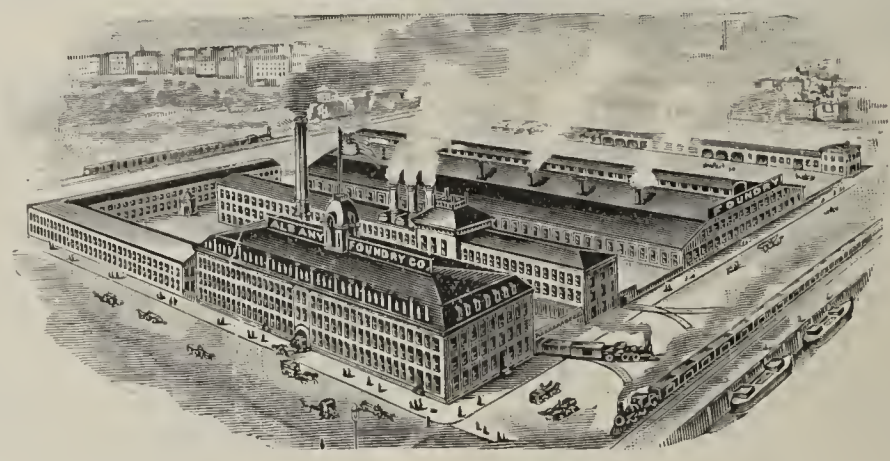
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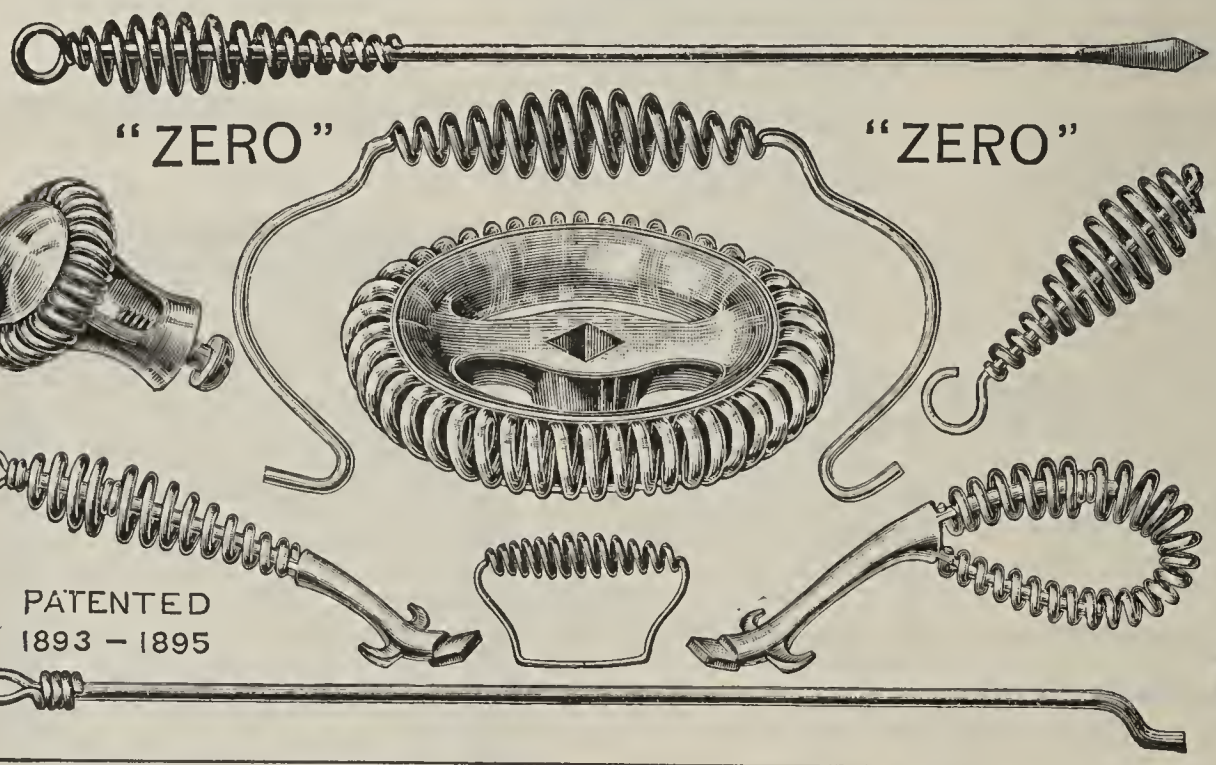
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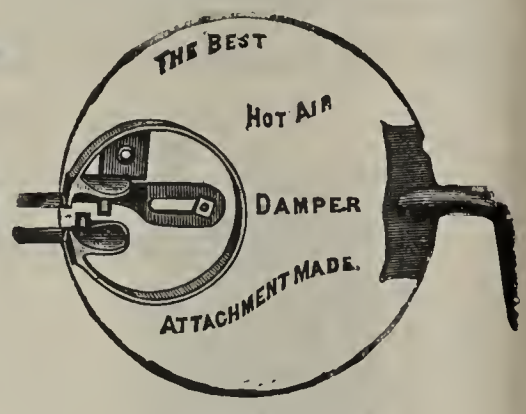


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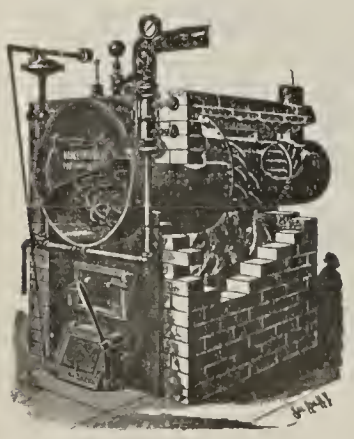


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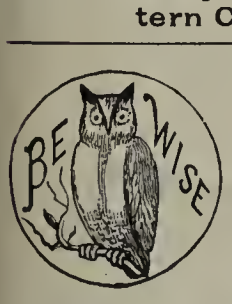
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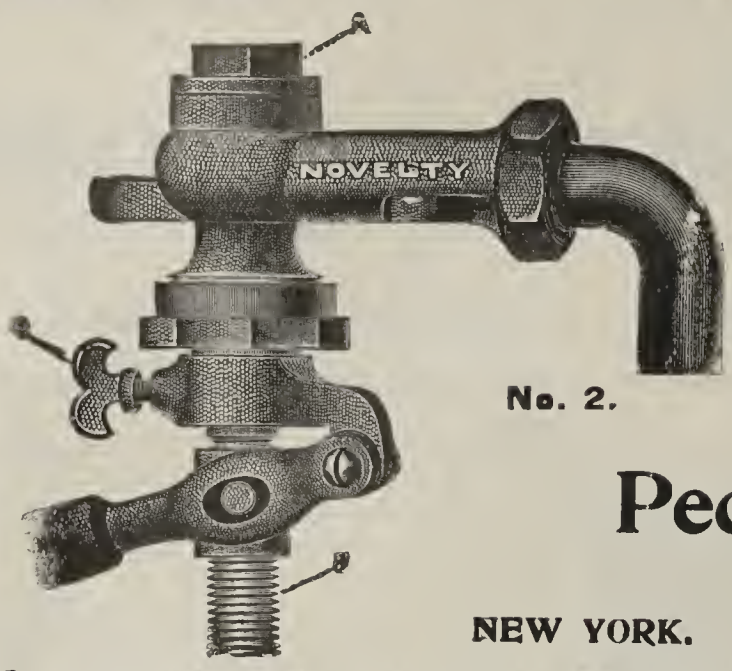
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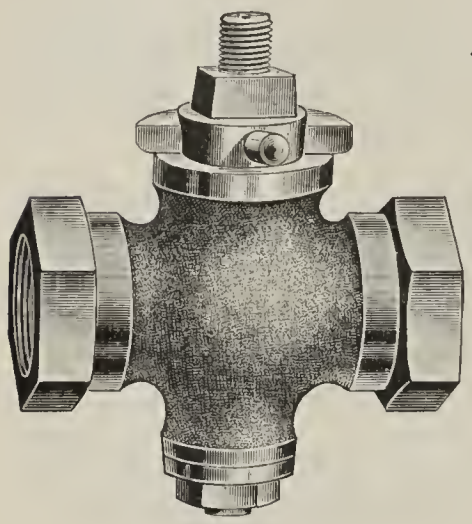
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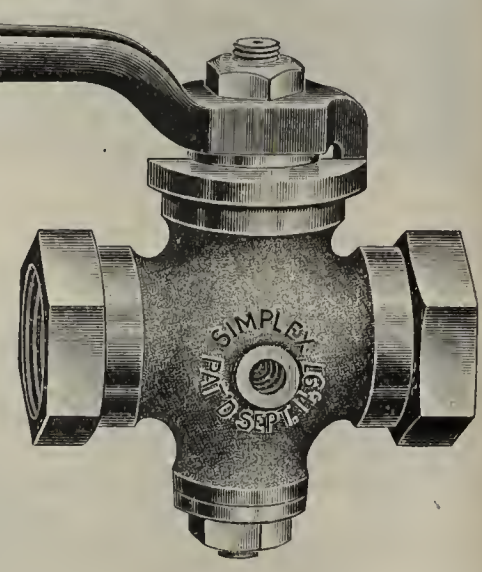
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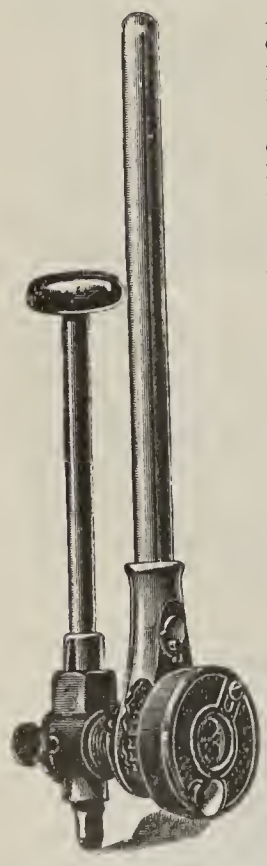
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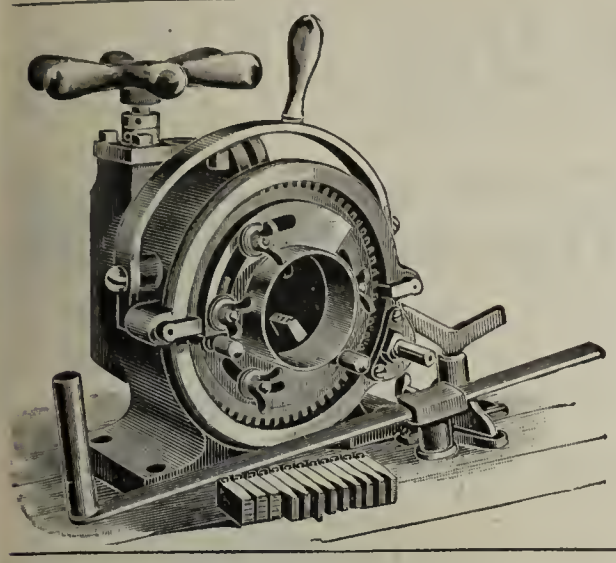
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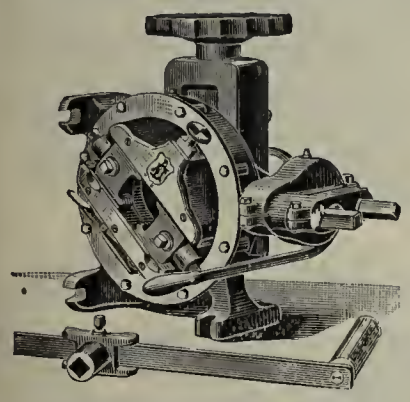
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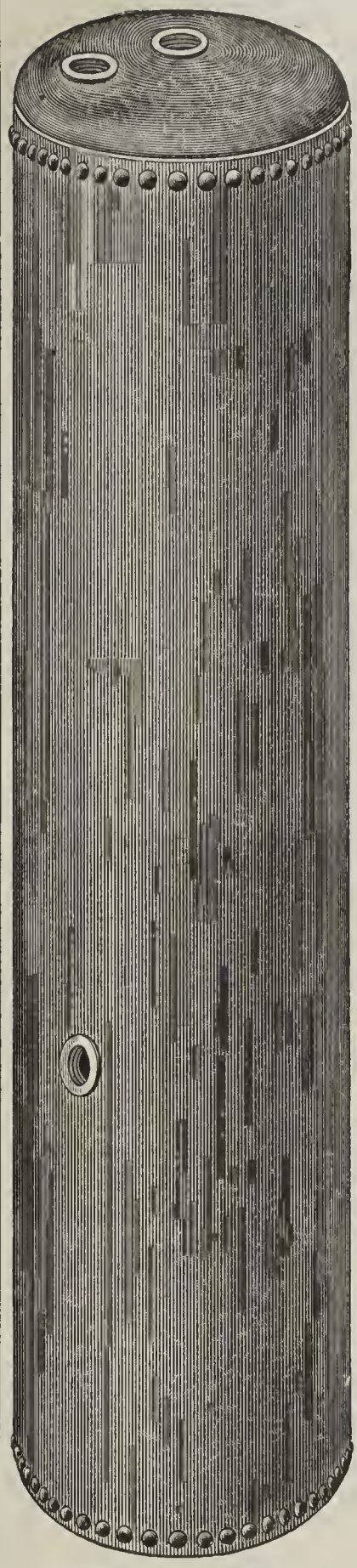
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TABLE OF CONTENTS.

FIRST ARTICLE.

Introductory,
The Distillation or Manufacture of Coal Gas,
The Distribution of Gas from the Gas Holder Through the Town,
Connecting the Meter in Buildings,
Inspection of Material and Work,
Laying Out Pipe,
Gas Fitters' Tools,
Piping the Building,
Measuring Pipes,
Cutting the Pipe,
Finding Leaks,
Putting Up Fixtures,
Gas Logs,
Economical Gas Burning.

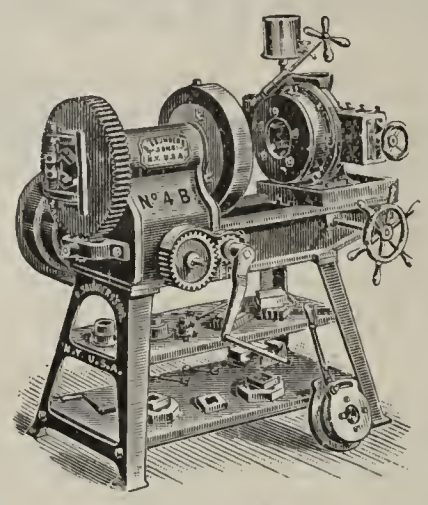
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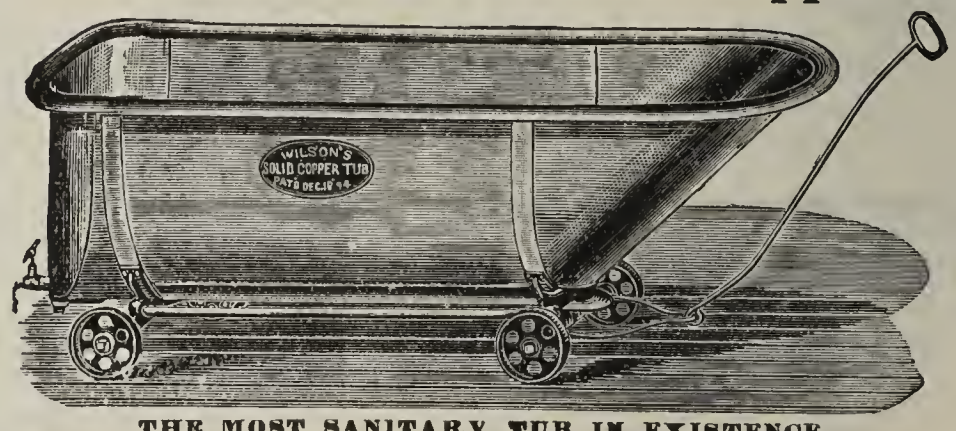
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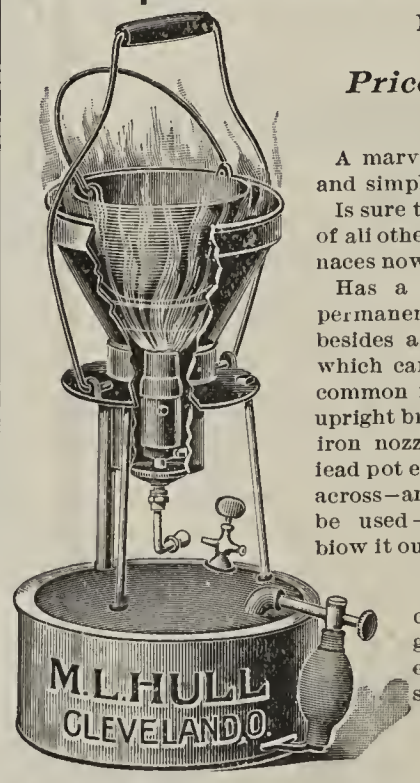
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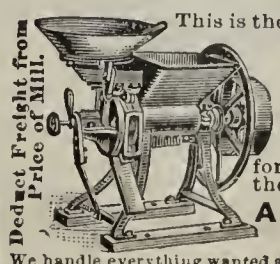
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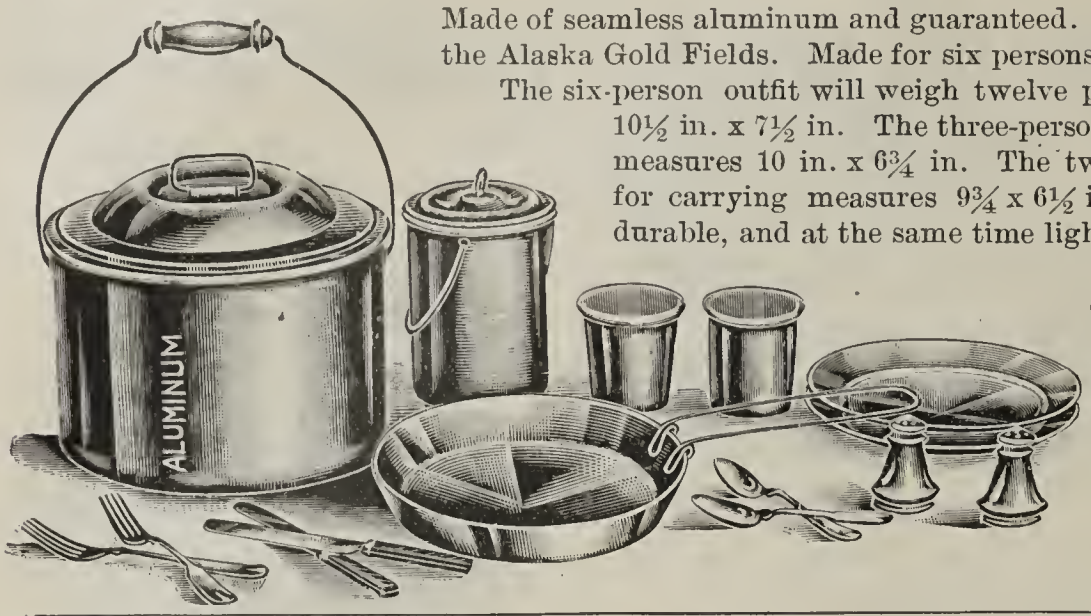
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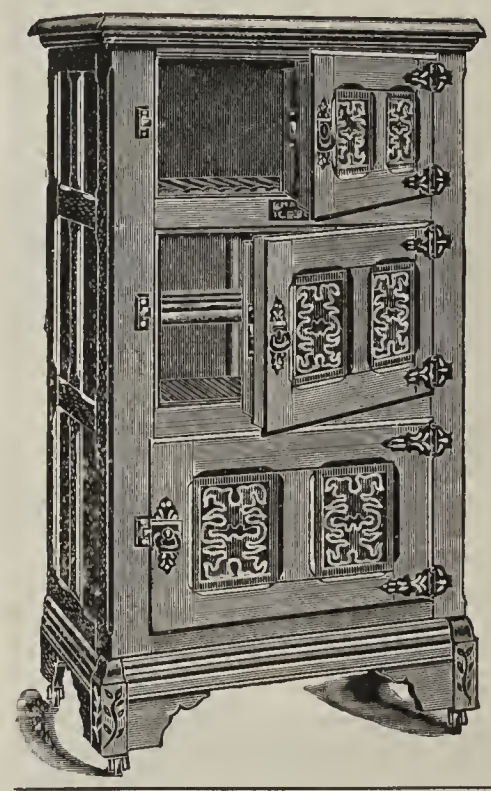
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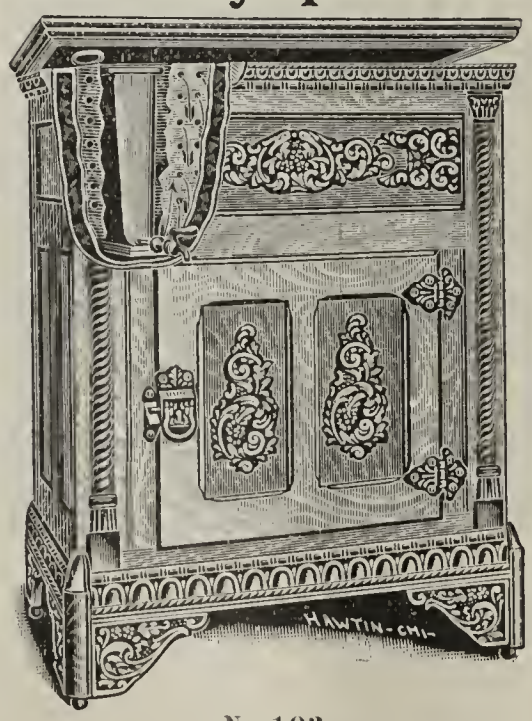
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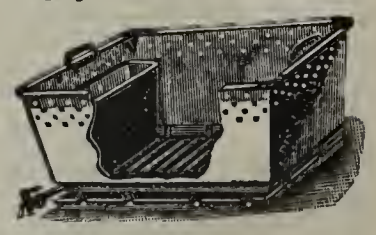
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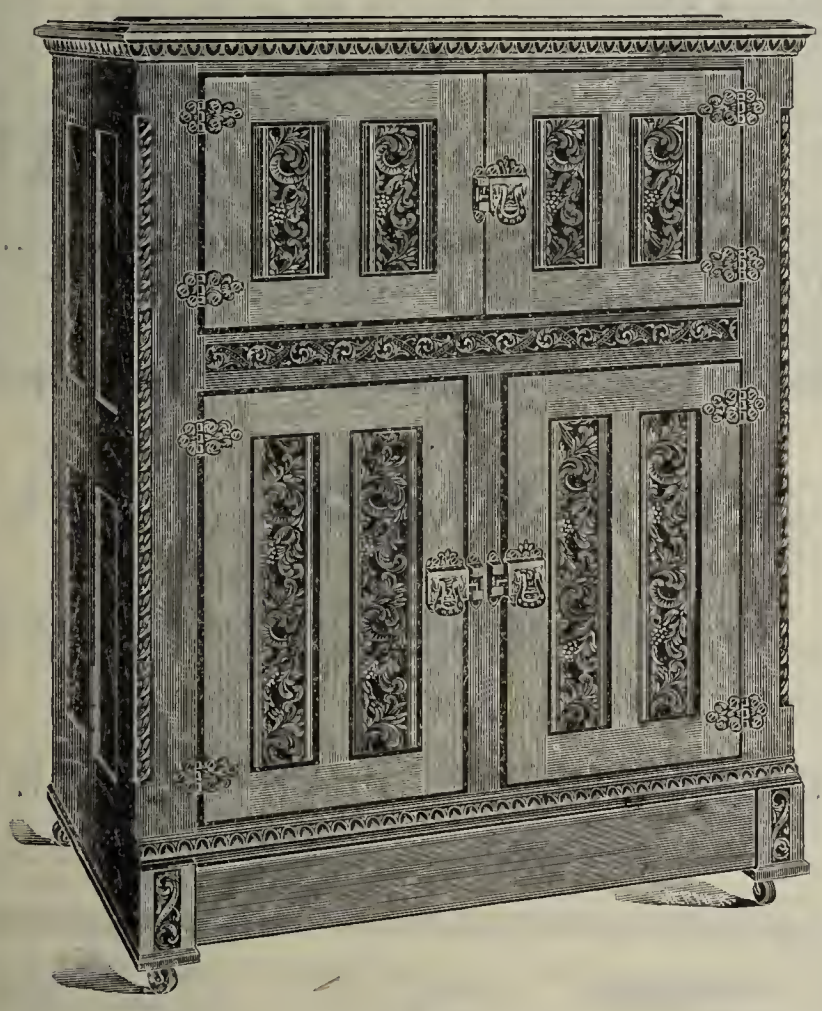
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Once more he went to develop; then the bell rang violently for the master, and the two held a long confabulation in the dark room together. This done the master tried his hand and went away to develop. It was not long before he returned and said he was sorry not to be able to get a satisfactory likeness, but a skull and crossbone appeared defined on the young man's forehead.

"Rubbish!" said the sitter; "my forehead's all right. Can you see anything the matter with my forehead?" and he peered into the mirror as he spoke.

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Upon this there was a dreadful scene, but the upshot was that the young man had to go, and up to the present time has never returned.

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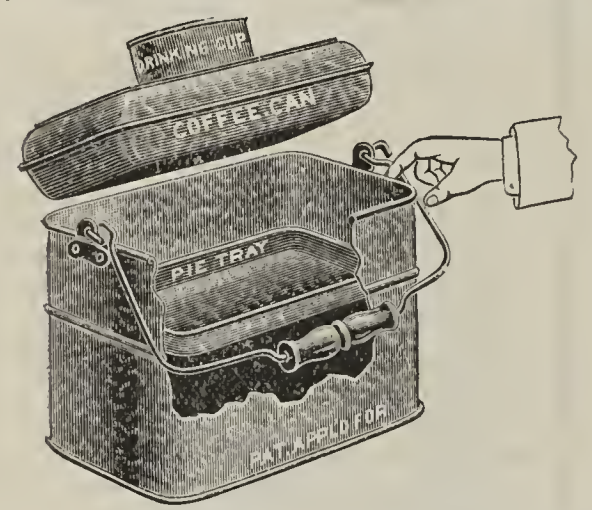
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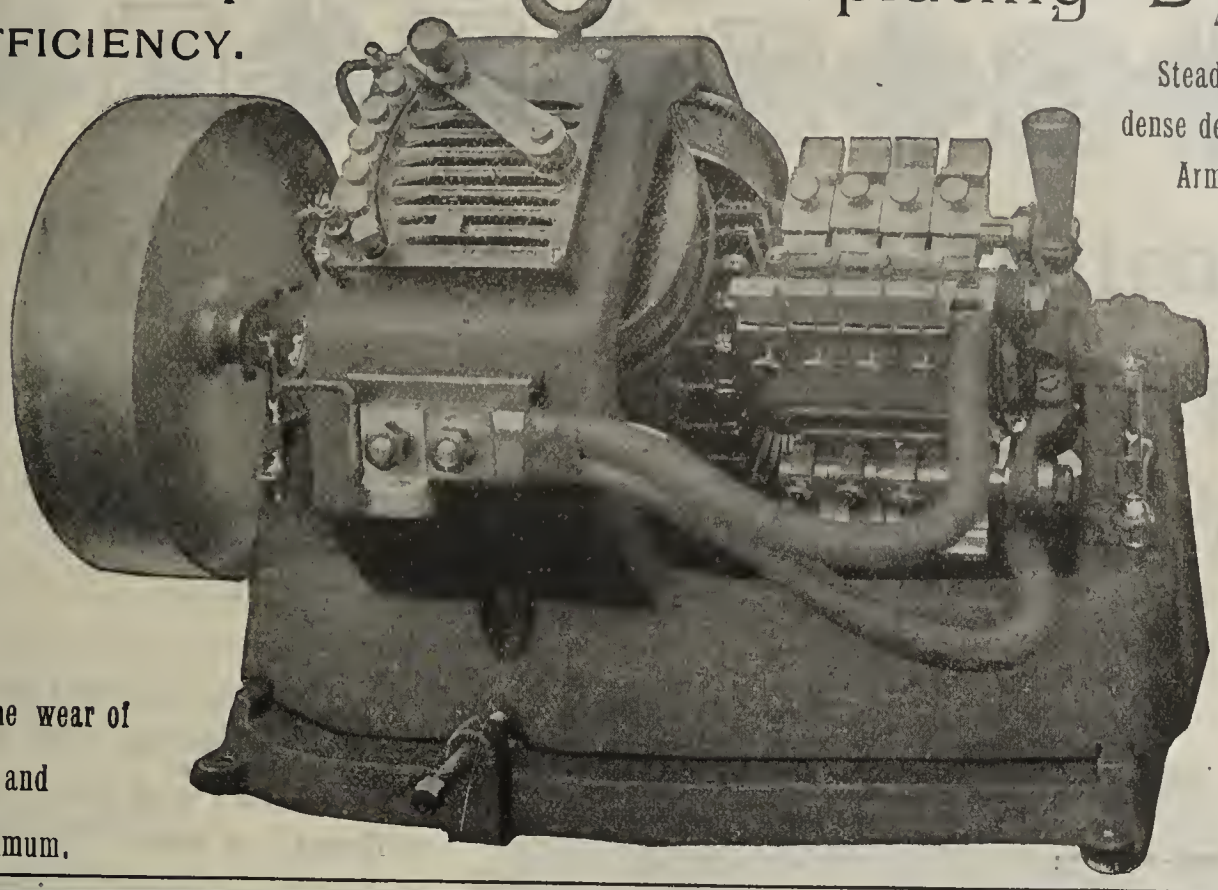
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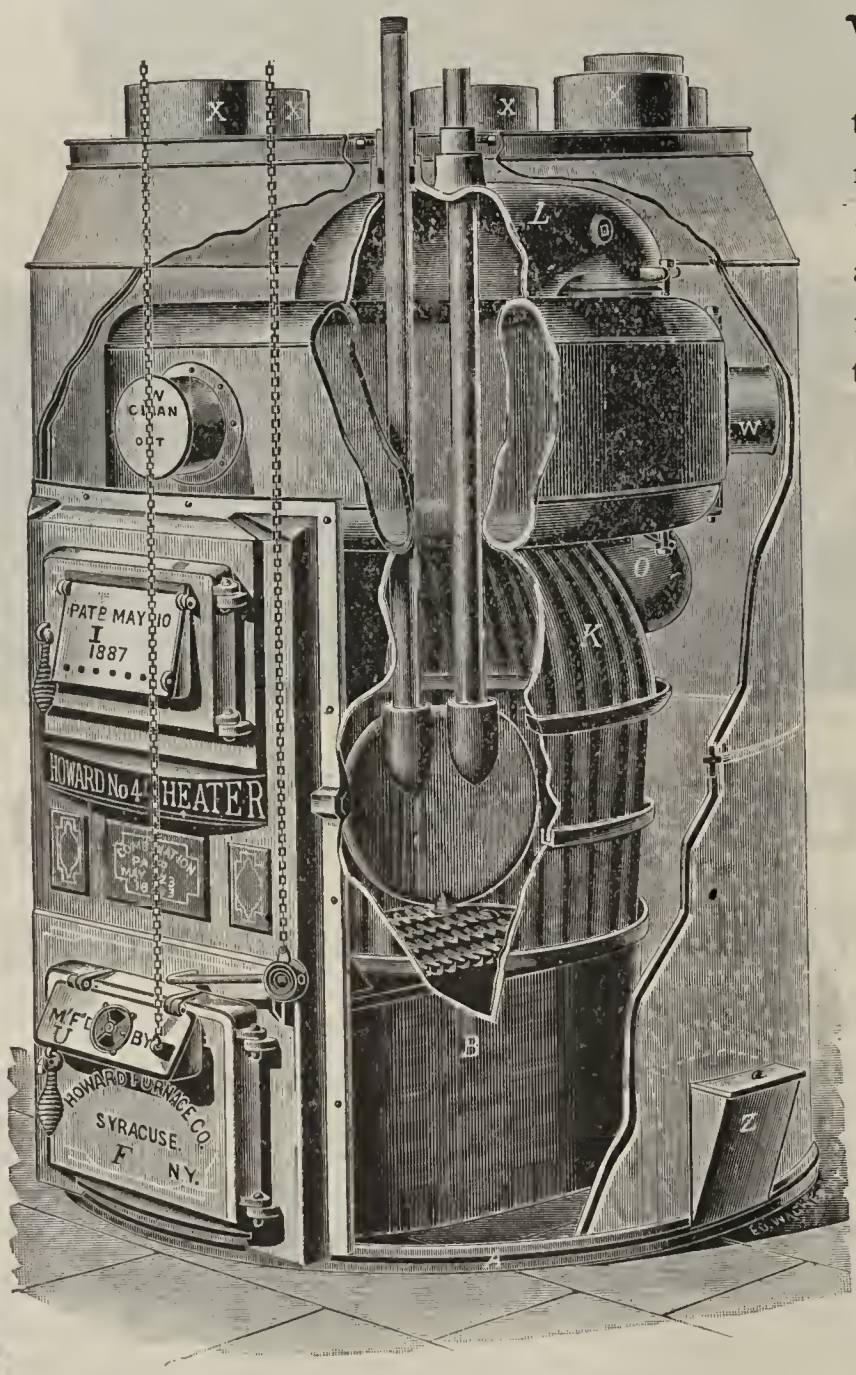
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Volume XLIX.....No. 4.
Index to Reading Matter.....Page 53.

The Business Situation.

The main obstacle to general trade in the past week was the unseasonably mild weather which prevailed over a large section of the country and which naturally interfered with the demand for winter goods. Nevertheless the volume of business seems to have been large. Reports from the different trade centers indicate a much more active movement of business than is usual at this early period of the year. This activity is most pronounced in the Western and Southern States, where the demand for manufactured goods, particularly in the line of iron and steel products, is exceptionally lively for the season. Orders for spring trade so far received are encouraging, and indicate a fuller volume of business than has obtained since 1892. The tone of all the markets is cheerful, and prices, while showing no radical changes, are generally steady with an upward tendency in some directions. One favorable feature of the business situation is the resumption of wheat exports on a large scale, with indications of a steady call for the cereal abroad. The total of exports of wheat last week was 5,513,000 bushels, as against 3,481,000 bushels in the previous week, 3,948,000 bushels in the corresponding week of 1897, and 3,202,000 bushels in 1896. Exports of corn and cotton also continue heavy and are made at steady prices, while general exports of both agricultural and manufactured products fully maintain the high level established in 1897. Railway earnings make a most favorable showing. The increase of gross earnings in December was more than 13 per cent. over the previous year. The *Financial Chronicle's* tables for the last week of December show a gain of 14 per cent., and for the first week of January an increase of 18 per cent., while the gross earnings of railway mileage, aggregating 160,000 miles, was $59,000,000 better in 1897 than in 1896, the improvement being entirely in the latter half of the year. A disturbing feature is the serious strikes against wage reductions in the New England cotton industry, the outcome of which is as yet undeterminable. An unusual amount of business is being done in manufactured iron of all kinds, but prices are still low. The tremendous output of pig iron that is going on makes that product somewhat weak, but the largest branch of business in the finished iron trade, that of steel rails, is phenomenally active just now, with orders for about 1,200,000 tons of material on the books of the mills and more in prospect. The metal trade is generally quiet. Negotiations in progress aiming at a consolidation of the tin plate mills impart an unsettled tone to that market. A plethora of idle funds in the hands of local bankers induced a further weakening in loaning rates during the week, but more activity is noted in commercial loans than for some time past. There has been a reaction in the stock market due to disquieting rumors of the strength of the silver sentiment in Congress. Speculative and commission house transactions, however, were very large. Collections are generally referred to as satisfactory.

The Bicycle Here and Abroad.

The growth of the bicycle here and in Europe has been toward the same goal, but along lines totally dissimilar. In both parts of the world the endeavor has been to produce a machine of the greatest strength, rigidity, durability and efficiency, with the least possible weight of material. Of late years there has been no radical or wide departure change in the design, if we omit the chainless type, the differences being found principally in modifications and details. These distinctive characteristics appear in evidence only upon close examination, and while they are wonderfully apparent to the expert, and serve to distinguish one wheel from its neighbor, they may be easily overlooked by the novice. The American bicycle has made a deep and permanent inroad into Europe, particularly in the markets of England, France and Germany, and is selling largely and easily in direct competition with the home product. This superiority is due in the main to the elegant appearance, high finish, and to qualities conducive to durability and easy riding. All of these results are due, primarily, to the methods of manufacture here pursued, and which differ radically from those in vogue abroad. There the endeavor has been to adapt, without serious change, existing tools to the requirements of bicycle manufacture; here the bicycle is built with tools designed for that particular work, and intended to do nothing else. The consequence is that we here have special machines adapted to finish each and every part of the bicycle, and to produce work with the greatest rapidity and accuracy. The tool builders early appreciated the probable growth of the bicycle industry, and devoted themselves to the production of the essential tools required. The American policy of making a special tool for doing special work was in this instance followed rigorously. European bicycle manufacturers are grasping the advantages thus presented, and are adopting, as far as they can, American methods and tools. Unfortunately they cannot purchase with the tools the ingenuity which brought them into being nor the skill which may successfully alter them. The high excellence of the American bicycle is therefore due in a great degree to the tool designer, who has been so quick to supply the demands made upon him, and whose entire training permitted the perfect solution of the problem.—*The Iron Age.*

TIN PLATES.

TIN PLATE IMPORTS AND CONSUMPTION IN 1897.

The complete statistics of tin and terne plates shipped from Great Britain to the United States in the calendar year 1897, as furnished in the last returns of the British Board of Trade, show that this country took last year 85,475 tons of foreign plates, or 27,576 tons less than the total importations of 1896, being a decrease of nearly 25 per cent. The total amount of Welsh tin plate shipped here in 1896 was 113,051 tons; in 1895,222,901 tons; in 1894, 226,879 tons; in 1893, 255,628 tons; in 1892, 276,479 tons, and in 1891, 325,143 tons. The following table, which gives the monthly tin plate exports in tons from Great Britain to the United States for the past six years—that is, since the establishment of the domestic tin plate manufacturing industry—is interesting for purposes of comparison:

	1897.	1896.	1895.	1894.	1893.	1892.
January	8.810	11,861	18,626	18,296	23,498	17,554
February	9,678	6,980	23,201	13,413	20,190	22,268
March	10,358	8,903	18,743	16,907	31,334	22,789
April	8,146	10,903	15,946	13,210	31,651	31,061
May	6,916	9,222	18,118	21,291	26,988	23,799
June	7,172	11,753	13,760	17,247	26,759	23,550
July	5,484	13,930	16,445	17,805	22,248	24,750
August	3,526	8,814	23,531	19,125	15,784	24,221
September	4,656	7,167	17,507	17,672	13,789	22,535
October	5,036	10,599	19,805	24,854	13,861	19,901
November	5,570	5,840	16,186	22,382	15,495	20,634
December	10,123	7,079	21,033	24,677	14,031	23,417
Total	85,475	113,051	222,901	226,879	255,628	276,479

The figures above given are significant as marking a steady decline in the volume of foreign tin plate actually consumed within the United States until it has nearly reached the vanishing point. Dividing the 85,475 long tons of 2240 pounds imported last year into boxes of 108 pounds, the total receipts of Welsh plates in 1897 represented about 1,754,300 boxes. It is estimated by good authorities that the packing interests, such as the oil, dressed beef, fruit, vegetable and fish canners, use up in a fairly good year fully 1,500,000 boxes of tin plate in their export business, on which they recover the drawback of 99 per cent. Taking this figure, which probably represents fairly the volume of last year's re-exports of tin plate, the net consumption of the foreign product in this country in 1897 is seen to have been about 250,000 boxes, or less than the annual capacity of a single eight-mill works. It is conservatively estimated that the consumption of tin and terne plates in the United States last year, outside of the amount used for re-exporting purposes, was from 5,000 000 to 5,500,000 boxes. This would leave a balance of 4,750,000 to 5,250,000 boxes to be accounted for by the domestic mills.

Colonel Ayers' official figures of American black plate production, just published, gave 252,650,230 pounds as the aggregate output of the American black plate mills in the first half of 1897, or the equivalent of about 2,340,000 boxes. It is certain that these figures were materially exceeded in the latter half of the year. Practically all the works were then steadily employed and the starting in of several new mills swelled the producing capacity considerably beyond that of the first six months. Probably 5,000,000 boxes would, therefore, fairly represent the 1897 output of American tin plate. Allowing for stocks in hand at the close of the year, this would make the actual consumption of foreign tin plate in the United States only about 5 per cent. of the whole amount used, leaving the American mills to supply the other 95 per cent.

Carried away by enthusiasm over the recently published official statistics of American Tin Plate production, an Indiana newspaper comes out with the bold statement in large type head lines that "America Turns Out Four-fifths of the World's Production." This is somewhat too previous. There is a little country called Wales which still makes Tin Plate for most of the world. Still we are "getting there," and there is no telling what may happen in a few years.

Automatic Can Making Plant.

Economy of production, combined with accuracy and excellence, is the secret of success in all lines of manufacture in these days of keen competition. To this end is the multiplication of time and labor saving machinery, which is a salient feature of modern industrial conditions. In the can making industry, the Great Western Can & Machine Company of San Francisco, Cal., have brought this principle to a high development. The company named have been formed for the manufacture of tin cans under a new automatic process, the invention of Axel Johnson, which promises to work a revolution in this industry. They also control the manufacture of the specially designed machinery used in the process, which, they advise us, is fully covered by patents both in this country and abroad. The system is entirely automatic from start to finish. Whole sheets of tin are fed in at one end of a series of machines and are delivered at the other end in the form of complete, tested cans, ready for immediate use. A line of this automatic machinery, it is claimed, is capable of turning out from 30,000 to 60,000 cans in a day of ten hours, at very small expense.

THE MACHINERY.

A half-tone engraving 8 x 42 inches, furnished us by the company, gives a complete view of the Great Western plant. Its dimensions prevent a reproduction of the same in these columns, but an intelligent idea of the machines and their operation may be gathered by our readers from the following description. The plant occupies a space about 15 x 60 feet. It is composed of five machines connected together, tandem fashion—namely, a body maker, a header or can forming machine, a side seam soldering machine, a machine for soldering tops and bottoms and a testing machine. The functions of these machines are as follows :

No. 1. *Body Maker.*—This machine takes a sheet of tin, squares it, trims it, forms the lock, makes the receiving groove for the tops and bottoms, cuts four bodies at one stroke, and discharges it into No. 2. But one operator is required on this machine.

No. 2. *Header or Can Forming Machine.*—The can is made entire on this machine with the exception of soldering. It is discharged from this machine to a chute which carries it to No. 3. Two girls are required to feed tops and bottoms on this machine.

No. 3. *Side Seam Soldering Machine.*—This machine is a rotary table with a bath for the acid and solder. The side seam of the can is soldered on this machine, and the can is then carried by chutes to No. 4. The machine runs without an operator, is a self feeder both as regards solder and cans.

No. 4. *Machine for Soldering Tops and Bottoms.*—Both tops and bottoms are soldered in the same bath in this machine, one boy and one man being required for its operation. The can is then carried by a system of belts and chutes to No. 5.

No. 5. *Testing Machine.*—This is a rotary machine, which clasps the can in a clamp, plunges it in warm water and detects any leaks that there may be in the can, by submitting it to 35 pounds air pressure. One man is required on this machine.

From the testing machine the cans are carried to the drier, a machine consisting of an inclosed system of pipes, from which they emerge ready for use. The machines occupy a space of about 15 x 60 feet. This space can be economized if necessary by returning the chutes—in other words, the plant itself could easily be put in a room 15 x 40 feet. A plant to make 30,000 cans in ten hours is run with 5 horse-power. A plant to make 60,000 cans would not require over 1 horse-power more.

NUMBER OF OPERATORS.

The company advise us that they ran this plant last season with the following people:

One boy on the body machine, at $4 per week ; two girls on the header, at $8 per week. The side seam soldering machine requires no operator, as it is self feeding ; two boys on the chain machine, at $7 per week; one man on the tester, at $10.50 per week, and five inspectors, boys, averaging $4 per week. This does not include crate shifters, men to pile tin, &c. One machinist at $2.50 per day takes care of the whole line.

GENERAL DESCRIPTION OF PROCESS

The following general description of the Great Western can making machine is furnished us by General Manager Charles Josselyn :

The tin plate in boxes, as at present manufactured by machines other than ours, has to be sorted by one or more expert sorters. We have, in our machines, obviated the necessity for this and excluded that item of expense. The tin plate as taken from the box is fed to the body machine by one boy. Our machine successfully trims. forms side seam portion, slits, crimps and rolls up the sheet in proper shape into four bodies complete, which bodies are then automatically delivered to the heading machine. The heads, top and bottom are, as usual with all can makers as with us, punched out of sheets of tin plate by presses, with specially prepared punches and dies, according to the class of can required, and these machines are usually operated by girls. The presses are of two kinds, hand or foot presses and power presses, operated by belt from countershaft.

The four bodies, as mentioned, automatically delivered from the body machine to the heading machine, are now in corresponding numbers fed to the machine. This is done automatically. Suitable runways are provided for bodies and heads, and these by gravity will connectedly enter and be received by the jaws of the heading machine; these jaws, being mounted between two disks attached to main shaft, will during one revolution gradually close the bodies around the heads, automatically lock and com press the side seam and discharge the complete can perfect. For purposes of spices or other dry substances the cans do not require soldering, the tops and bottoms being most securely locked and not pushed on.

One strong point in favor of our machines is the fact that we place the heads inside of the can, and fold the can body around the same in a crimped receiving groove, excluding the possibility of the heads falling off after having been put in place.

The cans are now delivered by a combination of elevator and runway or by gravity direct to the end soldering machine, where the heads—top and bottom—are soldered to the can body. This machine of ours has been arranged in a compact and double acting way. With one common flux and solder bath, and a consequent saving of practically half the gas usually consumed, our work is done in an efficient and thorough manner.

The cans are now as before, by means of elevator and runway, delivered to the side seam soldering machine. No flux and solder will flow on the inside of our can because of the peculiar shape of our lock joint. The cans are now delivered to the testing machine to ascertain their perfect condition.

The engraving referred to, showing the machines in operation, will be sent to any one interested on application to the Great Western Can Company, 139 First street, San Francisco, Cal. The machines are already in successful operation in several canning and can making factories on the Pacific Coast.

THE TIN PLATE MANUFACTURERS.

A meeting of tin plate manufacturers was held in the Hotel Lincoln, Pittsburgh, on Tuesday, January 18. D. G. Reid of the American Tin Plate Company, Anderson, Ind., was chairman. The meeting was largely attended, nearly all the principal concerns being represented in person. Letters were received from others not able to be present. The principal business under discussion was the plan formulated at the meeting held in Columbus some time since looking to the control of the tin plate trade much on the same lines proposed by the American Steel & Wire Company in the wire trades. A more recent meeting at which this matter was under discussion was held in New York and the meeting of Tuesday was to take further action upon it. A number of tin plate concerns have put prices upon their plants, and an effort will be made to control the tin plate trade and put it on a more profitable basis. The recent low prices at which cokes and the cheaper grades of ternes have sold have in many cases been below cost of production. While the plan proposed is yet in an embryotic condition, the progress thus far made is said to be entirely satisfactory.

SCRAP.

The Humbert Tin Plate Company's plant, at Canton, Baltimore, Md., leased from the Stickney Iron Company, which is being operated as an adjunct to the company's works at South Connellsville, Pa., is reported to be running very successfully and producing about 1600 boxes a week. The plant, which covers about 2 acres of ground adjoining the Stickney Iron Works, is a two-mill works, employing about 90 men. The whole of the product is sold to Baltimore consumers for the manufacture of Cans and Tinware.

The Wais & Roos Punch & Shear Company, Cincinnati, Ohio, who have recently made some extensive additions to their equipment, have lately made the following shipments to various Tin Plate manufacturing concerns. Laughlin Nail Company, Martin's Ferry, Ohio, shear; Johnstown Tin Plate Company, Johnstown, Pa., shear; Ætna-Standard Iron & Steel Company, Bridgeport, Ohio, billet shear; Humbert Tin Plate Company, South Connellsville, Pa., shear, and Neshannock Sheet & Tin Plate Company, New Castle, Pa , four shears.

A number of the leading tin can manufacturers of the country met in Chicago on the 10th inst. and organized the Can Manufacturers' Association of America. E. B. Breckinridge of Toledo, Ohio, presided. Permanent officers will be elected at a future meeting.

Edwin Norton of Norton Brothers, Chicago, left this week for Europe to remain abroad until April.

Owing to the want of remunerative orders, the Gwalia Tin Plate Works of South Wales were closed down on January 1 for an indefinite time.

The Joint Traffic Association has fixed the freight rate on Tin Plate and Black Plate in carloads from Connellsville, Pa., to Allegheny and Sharpsburg, Pa., at 5 cents per 100 pounds.

The calendar for 1898 distributed by James A. Coe & Co., Newark, N. J., is a handsomely decorated card measuring 14 x 10½ inches, carrying an allegorical figure who is in the act of welding on the new number 8 to the 189–. The figure is drawn in a spirited way and the coloring is pleasing. Incidentally attention is directed to Iron and Steel, Copper, Tin and Zinc, Structural Iron and Heavy Hardware handled by this concern. The calendar itself is a small pad at the lower corner of the card.

Three of the six new tin mills of the La Belle Iron Works, Wheeling, W. Va., were put in successful operation last week and are running steadily, giving the concern seven active mills at the present time. The other three new mills will also be started within a short time.

The plant of the Beaver Tin Plate Company, Lisbon, Ohio, manufacturers of Beaver Ternes and Charcoals, is running full and with excellent prospects ahead. This concern are having a large demand for their Plates and expect to run full time right through the spring and summer. This plant has been enlarged considerably since the initial works were built.

A New Enamel.

John Bentz, 912 South Charles street, Baltimore, Md., who was formerly foreman of Matthai, Ingram & Co.'s enameling works, has just been granted a patent on a new method of enameling iron ware, giving a surface entirely different from the ordinary gray enamel in common use. The new enamel is described as absolutely free from poison and requires but one coat and a single burnishing. It can be made in various styles and permits the inlaying of stones in a very simple way in any size or quantities, in stripes or other figures. This method of inlaying stones in the enamel is the chief feature of the patent, the stones being melted into the foundation coat in the burning and giving smooth surface. The new enamel, it is stated, can be made at a very low cost. Mr. Bentz, we understand, has made arrangements to manufacture this enamel with the Keen & Hagerty Mfg. Company of Baltimore.

The Illinois Central Railroad Company have contracted to carry four vessels in sections from the building yards at Jefferson, Ind., to San Francisco, Cal., for the Pacific Coast trade. The sections will load 50 cars, which will go to New Orleans and thence by the Southern Pacific road to San Francisco.

HEATING AND PLUMBING.

INTERNATIONAL HEALTH EXPOSITION.

An international exposition in the interests of sanitary science, to be held in New York City in the coming spring, promises, from the prospectus just issued, to be of unusual interest to many of the readers of *The Metal Worker*. The enterprise, with the title of the International Health Exposition, is under the management of Chas. F. Wingate as supervising director, who will have the co operation of the New York Household Economic Association and other kindred organizations, as well as the support of a strong list of members of Advisory Committees. The exposition will be held in the Industrial Building (Grand Central Palace), Lexington avenue and Forty-third street, New York, from April 25 to May 31. The projectors of the undertaking state that their object is to stimulate public interest in health matters by making a display of the best sanitary apparatus in every line. Models of buildings will illustrate the changes in construction, and the recent improvements in plumbing, heating, lighting and ventilation and sanitary defects will be illustrated by object lessons in bad work taken from existing buildings. In order to promote the educational influence of the exposition, the management will provide a daily series of popular lectures on sanitary problems by recognized authorities in their respective lines of work, and they also propose to offer special facilities to schools, teachers, physicians, health inspectors and others interested in health matters to visit the exposition.

The classified list of exhibits gives a good idea of the scope of the exposition. They are divided into a number of classes under the head of Domestic Sanitation, Municipal Hygiene, Food Products, Sanitariums, Hygienic Literature, Sanitary Organizations and their Work, Progress of Preventive Medicine, Military and Naval Hygiene, Animal Sanitation, Industrial Hygiene and Fire Protection. Of these divisions, the two first named are naturally given the greatest prominence. Domestic Sanitation embraces 11 groups, covering all the various aspects of this wide subject. These are as follows :

Group I.—The evolution of the Modern Dwelling, illustrated by plans, models and pictures of buildings at different periods and in different countries.

Group II.—The Plumbing and Drainage of Houses, contrasting past and present methods, with the drain pipes, traps and fixtures now in use and those formerly employed. This will include working models of plumbing apparatus in actual operation, to illustrate ventilation, siphonage, back pressure and other practical features.

Group III.—Injurious effects of Dampness on Health illustrated, together with right and wrong methods of preventig soil saturation.

Group IV.—Drainage of Country Houses, with plans and models of cesspools, sub surface irrigation and other modes of sewage disposal.

Group V.—A Model Cellar, showing how it should be constructed so as to secure abundant sunlight and ventilation and absolute dryness.

Group VI.—Domestic Heating Appliances ; stoves, heaters, open fire places, gas logs, hot air furnaces, steam and hot water apparatus

Group VII.—Domestic Ventilation illustrated. Common defects in ordinary houses. How to ventilate a kitchen, bathroom, halls and bedrooms in a proper manner. Ventilating fans and skylights shown in operation.

Group VIII.—Apartment Houses, Family Hotels, Office Buildings ; their special advantages and sanitary defects and how to correct them. Dangers from high buildings illustrated.

Group IX.—The Model Home ; its site and construction depicted in every detail.

Group X—Working Men's Homes as they are and as they ought to be. The Tenement House Problem in cities and its historical development. Designs of model tenements in different places.

Group XI.—Hygienic Clothing. Wall Papers and Draperies. Filters.

Municipal hygiene includes in its treatment such subjects as the sewerage and water supply of cities, public baths and laundries, garbage removal and destruction, methods of public lighting and heating, methods of sewage disposal, houses of public comfort, building regulations, &c.

Applications for space and detailed information should be made to the secretary of the International Health Exposition, Grand Central Palace, New York.

Wisconsin State Plumbers.

The fourth annual convention of the Wisconsin State Association of Master Plumbers was called to order at 11 a.m., January 12, in the Senate Chamber at Madison, Wis., by President W. H. Halsey of Milwaukee. Mayor Hoven delivered a short address of welcome. About 100 delegates were in attendance.

One of the important things decided upon was a resolution instructing the Executive Committee to prepare and disseminate throughout the State, at the expense of the association, a pamphlet on sanitation. The Executive Committee is composed of the officers of the association and the outgoing president. The question of the new State law requiring all plumbers to take an examination before being permitted to work at the trade was discussed. The discussion over the law was short, and little opposition to it was manifested. The session was executive, but several members said after it had adjourned that the members expressed themselves as favoring the law and as intending to obey it to the letter. No formal action was taken with reference to the law.

The officers elected are:

President, Charles Polacheck, Milwaukee.

Vice-President, A. V. Fetter, La Crosse.

Treasurer, C. L. Rundle, Oshkosh.

Secretary, Herman A. Wittig, Milwaukee.

District Vice-Presidents: F. Green of Janesville, H. L. Larson of Manitowoc, P. J. Dullanty of Ashland, J. P. Fox of Eau Claire.

Delegates to the National Convention: W. H. Halsey and P. H. Murphy of Milwaukee, J. F. Ahearn of Fond du Lac, William Owens of Maidson.

Delegate to Interstate League, P. H. Ryan, Oshkosh.

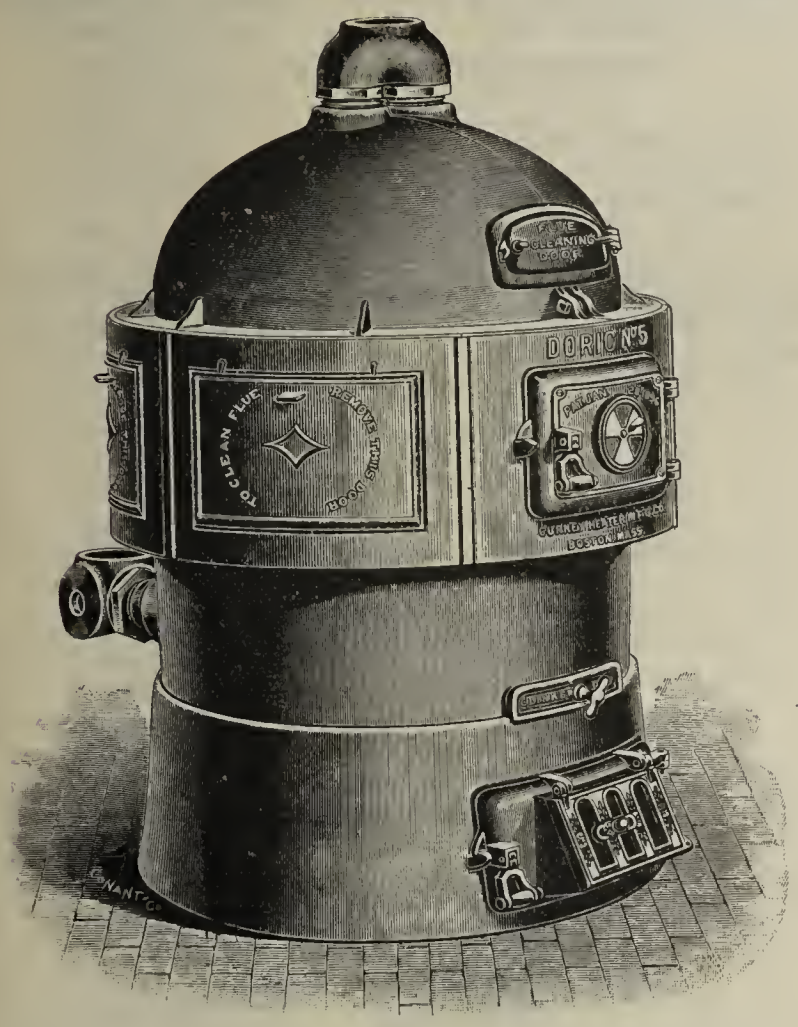
The Hyde System of Ventilated Plumbing Work.

We have the following interesting letter from Thomas Hyde, Albany, N. Y., respecting his system of ventilated plumbing work, and if there are any criticisms to offer on Mr. Hyde's remarks we should be very glad to hear from our readers. He says: "I have installed my system of ventilated plumbing work in a house in this city as an experiment to prove its merits to our Board of Health, and I might say for the information of those not acquainted with the thing that the result brought about is that each soil and waste pipe performs the function of ventilated ducts, which they prove to be, the traps being abandoned. The 4-inch soil pipe carried a velocity of 150 feet per minute under unfavorable conditions. One point raised against the result was that such air escape would exhaust the room of its heat, the house being heated by a hot air furnace, but there is no other means of ventilation than what is afforded by my system. It is also mentioned that some time, no matter how favorable the conditions, a down

draft would occur in the chimney. I met that with the remark that there is no place on this earth where the operation of natural law will not give a gaurantee that no such thing can occur if the system is properly constructed. I withhold comment myself upon this system, but will be very glad to have others discuss it."

The No. 5 Doric Heating Boiler.

The Gurney Heater Mfg. Company, Boston, Mass., have added to their well-known line of Doric steam and hot water heaters an additional size known as No. 5, illustrations of which are given herewith. Fig. 1 is a general view of the boiler, while Fig. 2 shows the boiler separated in two sections revealing its internal construction. The boiler, as shown in the illustration, is for hot water, but it is also made for steam heating. The size differs from Nos. 1, 2, 3 and 4 in being made in two vertical sections or halves, connected at the top and bottom by drums and lock nut nipples, making, it is pointed out, absolutely permanent and indestructible joints. In addition to the present heating surface contained in the other sizes of Doric boilers, in this particular size a horizontal row of specially made oval loops (or water tubes) have been introduced, which are so arranged that the direct fire surface of the boiler is very largely increased. The boiler being made in two vertical sections or halves it is easily handled and placed in cellars or taken through narrow passages or doorways. The No. 5, like their other sizes, is tested to 100 pounds per square inch hydraulic pressure, and the castings being made of even thickness and of the best quality of iron insure, it is pointed out, the utmost durability. The company also inform us that they will have two additional sizes of Doric boilers ready for the market about March 15—No. 00, with a diameter of grate of 11 inches, and No. 0, with a diameter of grate of 14 inches, this giving them seven sizes of this style of boilers with a capacity for hot water of from 250 to 1600 square feet and for steam of from 125 to 1000 square feet.



The No 5 Doric Heating Boiler.—Fig. 1.—General View of Boiler.

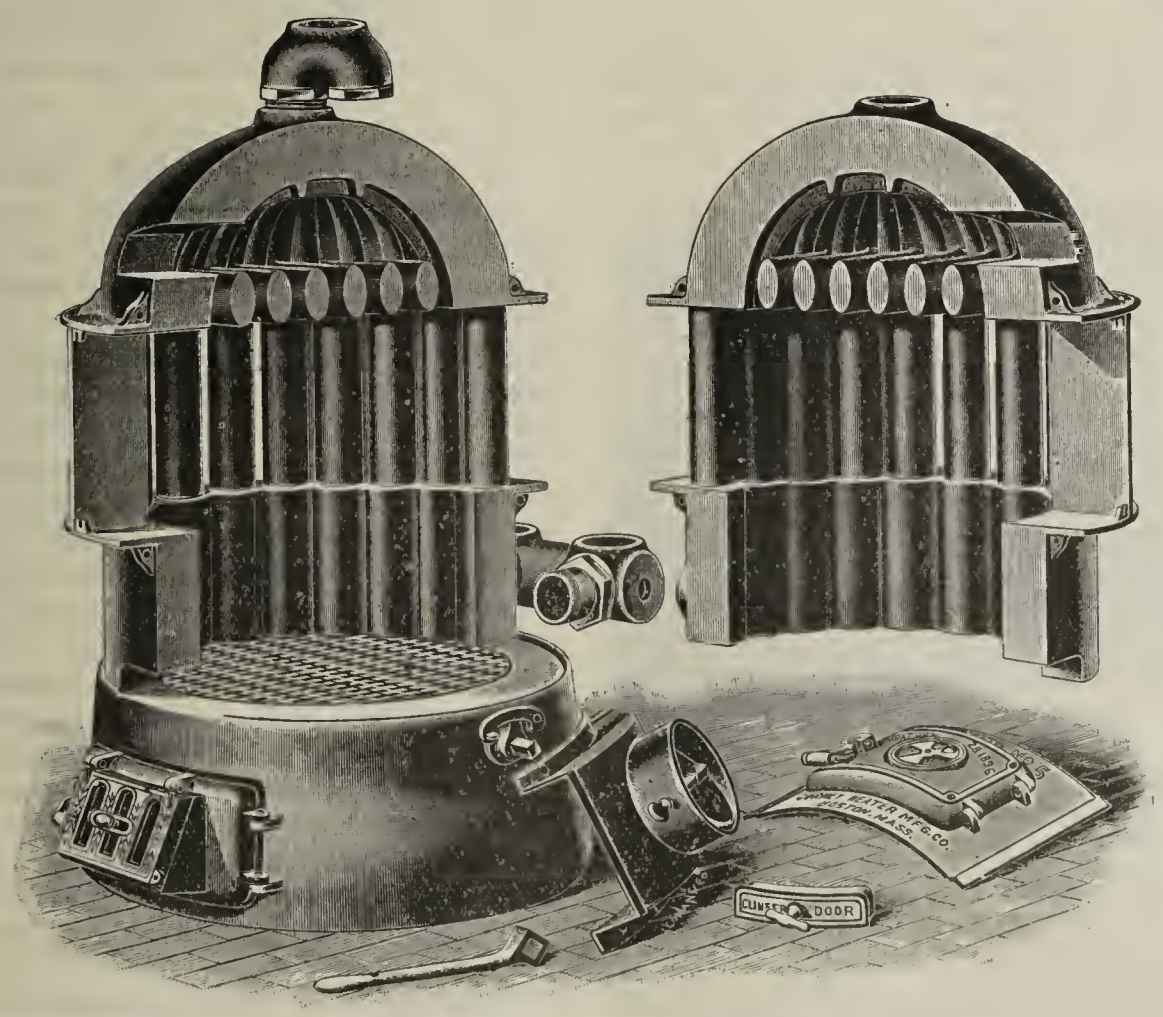
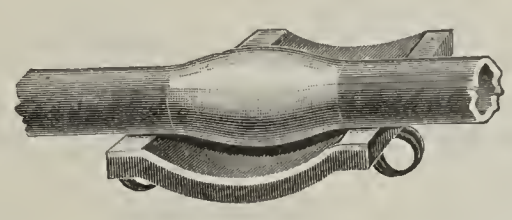


Fig. 2 —View with Halves Separated.

Porsch's Molded Wiping Cloth.

A special form of wiping cloth, for which many advantages are claimed, is made by John Porsch, 1222 Peach street, Erie, Pa., and is illustrated in connection with a wiped joint in the accompanying cut. The shape of the joint, it will be noticed, is formed in the cloth or pad and the result is, the makers state, that it is easy to wipe a smooth and uniform joint. The cloth is of rubber, cast and shaped like a joint, lined with sheet asbestos, which is a non-conductor of heat. Next to this are several layers of paper, the paper, it is pointed out, being preferable to ticking or mole skin cloth, because it insures a smooth surface immediately. In case the surface of the wiping cloth is torn another layer of paper can be pasted on without delay. Should the purchaser, however, prefer ticking it will be furnished instead of the paper. In referring to the advantages of this cloth, it is remarked that if the plumber is accustomed to wiping a heavy joint it is difficult for him to wipe a light one, while, similarly, if he is used to wiping light joints it is hard to wipe heavy ones. With the Porsch wiping cloth, however, any kind of joint can be made, either heavy, light, slim or narrow. The cloth has an elastic rubber band or finger strap, and if the operator desires he can wear kid gloves when using it.



Porsch's Molded Wiping Cloth, Used in Connection with a Wiped Joint.

THE FOURTH ANNUAL MEETING OF THE AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS.

On January 25 at 12 West Thirty-first street, New York, the fourth annual meeting of the American Society of Heating and Ventilating Engineers will open, and it gives promise of being one of the most interesting held by the society. We print below the programme, which this year is so arranged that those who cannot attend the entire meeting may be present when matters most interesting to them are under discussion. The reports of the officers will show the society in a prosperous condition and the substantial increase in membership is most gratifying. Those who may be in New York during the meeting and are interested in its work will be welcome as guests.

The Programme.

FIRST DAY. MORNING SESSION, JANUARY 25, 10 A.M.

ORDER OF BUSINESS.

1. Roll call.
2. Reading of minutes of previous meeting.
3. President's address.
4. Report of secretary.
5. Report of treasurer.
6. Report of chairman of the Board of Managers.
7. Report of chairman of the council.
8. Report of special committees.
9. Appointment of tellers.
10. New business.

AFTERNOON SESSION, JANUARY 25, 2 P.M.

PAPERS.

"A New Type of Hot Blast Radiator," by Geo. I. Rockwood.
Discussion.
"Some Experiments in Steam Circulation," by John Gormly.
Discussion.

TOPICS.

1. "The Rating of Heating Coils for Hot Blast Heating."
2. "Under What Conditions Is It Economical to Use Exhaust Steam When Such Use Creates Back Pressure?"
3. "Does the Present Day Competition Promote Good Engineering?"

NOTE.—The time for receiving the ballots for the annual election will expire at 3 p.m., January 25.

EVENING SESSION, JANUARY 25 7.30 P.M.

Report of tellers.

PAPER.

"A Test of the Heating and Ventilating Plant, New York State Veterinary College, Cornell University, Ithaca, N. Y.," by Prof. R. C. Carpenter.
Discussion.

SECOND DAY. MORNING SESSION, JANUARY 26, 10 A.M.

PAPER.

"Proportioning of Circulating Pipes for Steam and Hot Water Heating Systems," by J. J. Blackmore.
Discussion.

TOPIC.

4. "Does Our Society, as at Present Conducted, Meet the Objects of Its Organization as Laid Down in Article I of Our Constitution?"

NOTE.—Members, whether present or not, are especially urged to express their opinions freely on this topic for the guidance of the officers of the society.

AFTERNOON SESSION, JANUARY 26, 2 P.M.

PAPER.

"Single Pipe Low Pressure Steam Heating," by Mark Dean.
Discussion.

TOPICS.

5. "How Much Allowance Should Be Made for the Loss of Heat Through the Roofs of Churches and Such Buildings as Have Their Ceilings Attached to the Rafters on Which the Roof Is Laid?"
6. "How Are the Difficulties in the Proper Warming and Ventilating of Our Public Schools Best Met Where Steam Systems Are Used?"
7. "How Are the Difficulties in the Proper Warming and Ventilating of Our Public Schools Best Met Where Hot Air Furnaces Are Used?"

THIRD DAY. MORNING SESSION, JANUARY 27, 10 A.M.

PAPERS.

"English Practice in the Warming and Ventilation of Technical and Art Schools," by D. M. Nesbitt.
Discussion.
Paper to be announced.
Discussion.

TOPICS.

8. "Do the Results Obtained from the Use of Thermostats Justify the Cost of Their Installation?"
9. "Is There a Simple and Correct Method of Determining the Extent of Vitiation of Air?"
10. "In a Fan System of Warming, Is There Any Reliable Rule for Figuring Loss in Transmission Through Horizontal Ducts?"

AFTERNOON SESSION, JANUARY 27, 2 P.M.

PAPERS.

To be announced.
Discussion.
Installation of officers.

TOPICS.

11. General discussion on the methods in use for warming and ventilating hospital buildings.
12. "What Is the Commercial Efficiency of a Heating System?"
13. "The Conditions Governing Specifications."

COMMITTEES, 1897-1898.

COMPULSORY LEGISLATION.

B. H. Carpenter, Wilkes Barre, Pa.
W. F. Wolfe, Boston, Mass.
S. A. Jellett, Philadelphia.
A. Harvey, Detroit, Mich.
H. M. Swetland, Fredonia, N. Y.

UNIFORM CONTRACTS AND SPECIFICATIONS.

S. A. Jellett, Philadelphia.
D. M. Quay, Chicago.
J. J. Blackmore, New York.
A. E. Kenrick, Brookline, Mass.
A. C. Mott, Philadelphia.

STANDARDS.

J. H. Kinealy, St. Louis, Mo.
H. J. Barron, New York.
Wm. McMannis, New York.

TESTS.

A. A. Cary, New York.
B. F. Stangland, New York.
Henry Adams, Washington, D. C.

NOMINATIONS.

H. J. Barron, New York.
F. W. Foster, Boston.
John Gormly, Philadelphia.
T. J. Waters, Chicago.
Homer Addams, Allentown, Pa.

Nebraska State Plumbers.

The fourth annual convention of the Nebraska State Association of Master Plumbers was held January 10, 1898, at the Schlitz Hotel, Omaha, with some 40 members present. The meeting was called to order by President Korsmeyer, who introduced Thomas B. Culloton of Chicago, president of the National Association, who made a very able address, instructing the members what course to pursue for the benefit of the association. The question of forming a league of Nebraska, Kansas and Colorado was taken up and discussed, and Messrs. Bellamy and Korsmeyer were appointed delegates to confer with a like number of delegates from the States of Kansas and Colorado. The object of this league is the protection of the members in dealing with the manufacturers and jobbers, and it is to be on the same principle as the Interstate League of Illinois, Iowa, Wisconsin and Minnesota.

D. O. McEwan and John C. Reed were appointed delegates to attend the National Association and convention at San Antonio, Texas, with F. A. Korsmeyer and Leo Baroch alternates.

The following officers were elected for the ensuing year:

President, Wm. Bellamy, Omaha.
Viee-President, Geo. W. Cultra, Lincoln.
Secretary, G. K. Black, Omaha.
Treasurer, F. A. Korsmeyer, Lincoln.

At the close of the convention the visiting members were entertained by the local association with a spread in the Roof Garden.

Successful Plumbers at Milwaukee.

Of the 137 master plumbers who were examined by Examining Board 58 failed to pass, and have retained counsel to fight the law. There were 293 journeymen examined and 102 failed to pass. Below we give a list of the successful master plumbers:

Apel, H. C.
Baker, J. C.
Beck, William
Bigsby, C. E.
Boettger, W. C.
Bolter, W. F.
Britt, P. F.
Coogan, Edward.
Dahl, Albert S.
Dale, Burt.
Dearsley, Henry D.
Dengel, F. R.
Diele, E.
Dillman, Ed.
Dittmar, Oscar H.
Does, B.
Dorrler, Albert.
Doyn, E. T.
Egan, William H.
Eggert, L. A.
Finer, John.
Fluegge, F. A.
Foran, J. A.
Fox, Charles J.
Friend, L. R.
Fuchs, Phil A.
Grievel, F. L.
Habermahl, Eugene.
Halsey, W. H.
Hanley, S. V.
Harper, Charles
Julian, J. B.
King, F. R.
King, P. J.
Kinney, R. F.
Kuenzli, F. A.
Kuettemeyer, F. C.
Laas, A. J.
La Velle, J. W.
Lehan, F. F.
Lippert, Albert.
Luedke, Herman.
Maag, Arthur J.
Magrath, M. J.
Meyer, L. F.
Mixdorf, R. T.
Mueller, E. H.
Mueller, G. J.
Murphy, F. J.
Murphy, Peter F.
Murphy, Phil H.
Nicholson, W. S.
Noeltz, Albert L.
Plum, L. H.
Polacheck, Charles.
Polacheck, Phil.
Pripps, Bernard.
Robertson, J. E.
Roth, Hermann.
Saeger, Rudolph.
Schroeder, Charles R.
Schwind, A. R.
Shuh, Jacob.
Shumann, Charles G.
Shunk, John.
Siebert, H.
Smeaton, Robert G.
Smith, Frank J.
Spaar, William F.
Stollberg, L. R.
Strelow, F. C.
Sullivan, James.
Theis, F. H.
Voltz, Charles J.
Weidner, E. A.
Werner, W. F.
Williams, John R.
Wittig, Herman A.
Zimmermann, O. P.

Defective Plumbing Work.

The James W. Gifford Company of Attleboro, Mass., have favored us with two photographs of a pair of water closets which they have taken out, and which is an illustration of how badly work can be done by an uneducated plumber. They write: "While our city is well up to date in many things, and provided with excellent plumbing regulations, we are without an inspector of plumbing, and it sometimes happens that this kind of work is put in good buildings by the lowest bidder. It will be noticed in Fig. 1 that the back air or vent connections are brought together, and then the local vent connections run into them, making a perfect by-pass for sewer gas into the house. Then, as if this was not sufficiently hazardous to the health of the inmates of the building, this vent pipe is connected to the soil pipe stack with a 2-inch sheet metal pipe, making an opportunity for the sewer air to enter from either direction. No lead bends, ferrules or floor plates were used, but the closet screwed to the floor over the cast iron fitting below. The work was taken out, then set up again with the same pieces of pipe to be photographed. Did you ever see a worse job from a sanitary point of view?"

The general arrangement of the job as found is readily followed in the picture presented in Fig. 1. In Fig. 2 the method of connecting the local vent of the closet into the trap vent may be more clearly understood. That portion of a plumbing system which connects with the house drains should be made of a durable material, inasmuch as the air which passes through it under many conditions will be laden with moisture, which will condense and aid in the corrosion. Sheet iron is not well calculated to stand the ravages of the gases. The vent pipe should, by all means, be either of lead or cast iron, unless the building has the modern system of wrought iron pipe work. The local vent from the closet should not be connected with either the vent stack or the soil stack, but should be preferably connected with a warm chimney or run independently through the roof in a warm place, so as to induce an upward current in the local vent pipe. In some instances an enlargement in the local vent pipe is made in which a gas jet is placed to supply the heat to induce an up current. As has been pointed out, the air from the sewer could readily pass up the soil stack through the



Defective Plumbing Work —Fig 1.— View Showing General Arrangement.

Y-branch over to the closet, and even though the connection between the closet and the drain pipe were tightly made there would be nothing to hinder it passing up to the back air pipe, then around through the local vent pipe into the building, as may be readily seen by an ex-

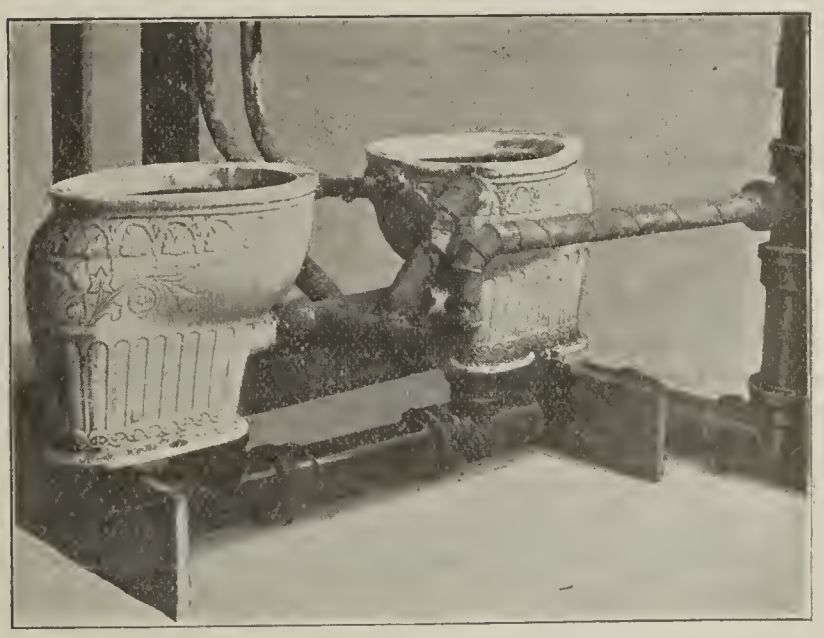


Fig. 2 — View Showing Drain Opening Into Building through Vent and Local Vent.

amination of Fig. 2. On the other hand, there would be nothing to prevent sewer air coming through the vent pipe to the local vent and passing directly into the room from the closet. The character of the plumbing regulations in the city is reflected in the work, as an attempt has been made to meet the provisions of these regulations, although the result of the attempt has been faulty through

the incompetence of the workman. Such work would never have passed had it been inspected by a competent plumbing inspector. If work of this character is brought to the attention of those who have charge of sanitary legislation, the difficulty of securing the enactment of proper laws will be very much reduced. We shall be glad to have our readers send us pictures or sketches and descriptions of such work.

Newark Master Plumbers.

The officers elected at the annual meeting of the Master Plumbers' Association of Newark, N. J., were installed on Friday, January 14 They are as follows:

President, Ira Budd.
Vice-President, W. B. Champlin.
Recording Secretary, E. A. Bleything.
Financial Secretary, Wm. Jacobi.
Treasurer, F. J. Sturn.
Sergeant-at-Arms, A. Grohman.
Trustees: C. Sullivan, A. S. Walker and C. Zimmerman.

A smoker will be given by the association in the near future, and the following committee has it in charge: A. S. Walker, Wm. Jacobi, F. J. Sturn, Robert Berla and L. Stephens. A feature of the meeting was the remarks on the benefit of association. One case was cited where a member sent his men to make a sewer connection at the time he went to get the permit, and the men were ordered to stop working by a plumbing inspector. Another member of the association, engaged in similar work on an adjoining property, interested himself to satisfy the official so that the work could go on till his fellow member appeared with the permit. In another instance a plumber was making a sewer connection near the shop of another plumber, who explained to him an easy method of opening the sewer from the inside and loaned him necessary appliances for doing it. Such actions had been unknown previous to the association, and the members were urged to get all in the trade to join the association and increase its usefulness.

Iowa Master Plumbers.

The ninth annual convention of the Iowa State Association of Master Plumbers was held in Germania Hall, Dubuque, Iowa, January 11 and 12, with the following delegates present:

Des Moines, W. Rocene, J. Haller, T. H. Kuntz, H. H. Walker, J. Linanne.
Dubuque Rob. Jungk, McDermott & Gow, W. S. Molo, Mullen Bros., M. Mullen, B. Pape, W. J. Nesler.
LeMars, Charles Syms.
Manchester, George L. Leisler.
Maquoteka, J. Kleinfelder.
Marshalltown, David Coulton, W. L. Reed.
Muscatine, P. J. Barney.
Sioux City, J. H. Durkie.
Waterloo, W. B. Griffin, F. Kramer.
Waverly, W. H. Temple.
Cedar Falls, J. Sheerer, L. Wartman.
Cedar Rapids, E. O. Edron, George McDonald, Messner & Co., H. F. Miller, George Myers, W. H. Taylor, William Yates.
Clinton, George Kendall.
Davenport, R. Clayton, F. Wernentin, G. F Ahrens, Hy. Durkee, S. Deidrichsen.

The official reports showed a membership of 124, an increase of 10 per cent. during the year, and a good balance in the treasury.

Four new local associations were formed during the year, namely: Mason City, with four members; Charles City, with four members; Clinton, with six members, and Boone, with five members.

One local dissolved during the year, Keokuk, leaving 16 locals now in force.

The local association entertained their guests with a banquet and a dance, which were thoroughly enjoyed. On the second day the convention decided to purchase printed matter dealing with the importance of good plumbing to be distributed to the best advantage. President Ahrens in his address dwelt on the need of a plumbing law in the State and related the good results that had been attained in Davenport through the adoption of an ordinance requiring an inspector of plumbing, James Cameron. Mr. Cameron was introduced as the only plumbing inspector in Iowa, and gave an interesting account of his duties and experiences.

After disposing of the general business of the convention the following officers were elected for the ensuing year:

President, Fred Wernentin, Davenport.
Vice-President, W. S. Gow, Dubuque.
Secretary, E. O. Edson, Cedar Rapids.
Treasurer, George Stewart, Burlington.
Delegate to the National Convention, W. Rocene, Des Moines.
Alternates: C. G. Boesechi, Burlington, and Robert Clayton, Davenport.

The president and secretary are constituted, *ex officio*, delegates to the national convention, giving this association three delegates.

Missouri Master Plumbers.

We give herewith a complete list of the officers of the Missouri State Association of Master Plumbers, elected at the convention at St. Joseph, Mo., and of which we gave an account last week:

President, M. J. Ward.
First Vice-President, E. D. Hornbrook.
Second Vice-President, R. T. Connell.
Treasurer, Henry Goss.
Secretary, Wm. Schwehr, Jr.
Delegates to the National Convention: Jeremiah Sheehan, E. D. Hornbrook and M. J. Ward.

After the election the following committees were appointed:

Constitution and By Laws: J. S. Sheehan of St. Louis, E. D. Hornbrook of Kansas City and I. T. Hopper of St. Joseph.
On Credentials: Thomas Tuffy of St. Louis, Henry Goss of Kansas City and M. W. Jackson of St. Joseph.

The Boston Clean Out.

In the accompanying illustration we show the Boston clean out, made by Crawford & Young, 224 Franklin



The Boston Clean Out —Fig. 1.— With Cover On.



Fig. 2.—Showing Cover Removed.

street, Boston, Mass. It is designed for use in connection with drain pipes, and is made 4 inches in diameter, and so that it can be readily calked into the hub. Fig. 1 shows the clean out with the cover tightly held in place with a brace provided for the purpose. Fig. 2 shows the brace turned so that the cover can be removed. It is made with a ground joint, so that it is said to be perfectly tight without the use of a washer, and it is much more convenient in use than the old method of screwing a cover off and on. The claim is made that it is absolutely water tight under all pressures. The body is of cast iron neatly japanned, and it is provided with a heavy cast brass cover, so that a firm uniting of the parts by corrosion is impossible.

DAY CLASS IN STEAM AND HOT WATER FITTING.

The excellent training given to those who have attended the Day Class in Steam and Hot Water Fitting at the New York Trade School has had the effect of bringing a larger number to the school than ever before. The class numbers 22 and is under the supervision of Thomas E. McNeill, who lectures twice each week. When at work in making coils, running pipes, connecting radiators, traps, pumps and the various appliances of both high and low pressure steam systems and hot water systems, the class is in the charge of Benjamin D. Thompson. In order that the scholars may become familiar with plans, lessons in drawing have been added to the course. The names of the class which entered on the three months' course January 5 are as follows :

Barber, Calvin J., Rockport, N. J.
Bowman, Ralph F., Millersburg, Pa.
Feeley, Jas. E., Lenox, Mass.
Fox, Edward E., Eau Claire, Wis.
Franklin, Laurence, Melrose, Mass.
Gartner, Louis, New York City.
Geoghegan, Joseph G., New York City.
Goss, Eugene W., Auburn, Maine.
Hardendorf, Del. S., East Albany, N. Y.
Hegel, James S., Peekskill, N. Y.
Hoffman, Stuart I., East Orange, N. J.
Johnson, John N., Millersburg, Pa.
Kirton, J. D., New York City.
Kuhn, Wm. H., Bridgeport, Ohio.
Nick, Oscar H., Erie, Pa.
O'Brien, Harry A., New York City.
Quinn, William, Salem, N. Y.
Ransom, James R., Plymouth, Mass.
Revitt, John H., Newark, N. J.
Searl, Arthur E., New York City.
Seavor, Stephen, New York City.
Stevens, Isaac J., Hazleton, Pa.
Thompson, Alex. C., North Sydney, Cape Breton, Can.

Paterson Master Plumbers.

The Master Plumbers' Association of Paterson, N. J., have elected the following officers for 1898:

President, John H. Quinn.
Vice-President, John Baker.
Recording and Financial Secretary, John Campbell.
Treasurer, Andrew J. Fielding.
Sergeant-at-Arms, Adolph Weber.
Trustees, James Kearney, John Baird, Charles Leitch.
Sanitary Committee, John Hickman, Charles Schneider, Charles Seibel.

In reporting the condition of the association, Secretary John Campbell, 26 Lake street, says that while the Paterson local is not so strong in members as some of her sister locals they are loyal to the constitution and by-laws of the National Association. We learn from Mr. Campbell that the Assemblymen and Senator from Passaic County have pledged themselves to support any reasonable measure that may be introduced in the Legislature to protect the people from being poisoned to death by the botched plumbing work that is being done all over the State by so-called plumbers.

NOTES.

A consolidation of the sanitary ware potteries of New Jersey and the West is being talked of as among the possibilities. A press dispatch of recent date from Trenton, N. J., asserts that all the leading potteries in that State are in sympathy with the movement. William Burgess, of the International Pottery, is mentioned as prominently identified with the scheme. The objects of the combination are said to be to reduce the cost of production and lessen office and selling expenses; also to control the output of certain necessary materials, such as feldspar.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until February 7, for a Low Temperature Hot Water Heating Apparatus for the United States Custom House and Post Office Building at Norfolk, Va.

The good work done by the International Correspondence Schools, Scranton, Pa., in the line of plumbing, heating and ventilation is indicated in a little pamphlet the schools issue containing letters from many scholars in different parts of the United States testifying to the benefits they have derived from taking a course of instruction by correspondence.

W. A. Wadsworth of the Wadsworth Plumbing Company, Cleveland, Ohio, in discussing the differences between the master plumbers and journeymen in reference to the apprenticeship question, said: "The men do not really object to working with helpers. In fact, they are anxious that helpers should be employed. What they are holding out against is working with apprentices. If the journeymen were given their own way the trade would pass out of existence in another generation. If there are to be no apprentices how are the journeymen to be recruited? The whole issue is utterly absurd. No labor organization has the right to say that the young men of this country shall not learn a particular trade. Where would these same journeymen be had the right of learning a trade been denied them?"

George McKnight has opened a plumbing shop in the basement of the Munn Building, Freeport, Ill.

Mayor Taggart of Indianapolis, Ind., has vetoed the ordinance regulating plumbing in that city, owing to section 27 being too drastic, as it allowed but ten days for connections to be made with the sewer for all buildings where vaults or cesspools are now used.

Building Inspector Turnbull, Hartford, Conn., has been sending out notices to the various plumbers in the city announcing that hereafter the use of flexible rubber elbows will not be allowed in the vent connection of closets, sinks, bathtubs or other similar work in the construction of new houses. Violation of this rule will be punished when discovered.

M. T. Baine, 315 North Summer street, Nashville, Tenn., sustained a $300 loss through a fire in his plumbing establishment last week.

W. A. Butler, who is a plumber, has been appointed supervisor of the *City Record*, the official paper of New York City.

Skeer & Young succeed Skeer & Blough in the plumbing and tinsmithing business at La Grange, Ind., D. Young having purchased the interest of F. Blough.

John Stock & Sons, San Jose, Cal., bid $3685 and secured the contract for plumbing the Hensley Block.

R. J. O'Crowley, Jr., who is representing the Henry McShane Mfg. Company, Brooklyn, N. Y., lives in Newark, N. J., and is building up a fine trade among the plumbers in New Jersey.

J. Frederic Mauer of the Crosby Steam Gage & Valve Company, 78 John street, New York, is bringing to the notice of the heating trade the Crosby Spring Seat Steam Valve, a feature of which is a removable disk and seat, so that the valve body may be used indefinitely by renewing these parts when necessary. A circular is published by the house, giving full particulars.

Alonzo Derby succeeds the plumbing firm of Whiting & Derby, at Stratford, Conn.

An announcement is made in the *City Record* of Boston, Mass., of the establishment of a repair division under the Building Department, with Charles Logue as chief, to make repairs to the plumbing, gas fitting, heating and roofing of public buildings.

Hardwicke & Co. have been incorporated at Niagara Falls to do a heating and plumbing business. Capital $5000, and directors: William H Cookman of 122 Sixth street; F. H. Salt and A. H. G. Hardwicke of Niagara Falls.

At the annual meeting of the Examining and Supervising Board of Plumbers, at Rochester, N. Y., George H. McCaffrey was elected president. The board consists of George H. McCaffrey, Alfred O. Kane, David C. Smith, J. Henry Howe, James F. Hogan, and the city engineer.

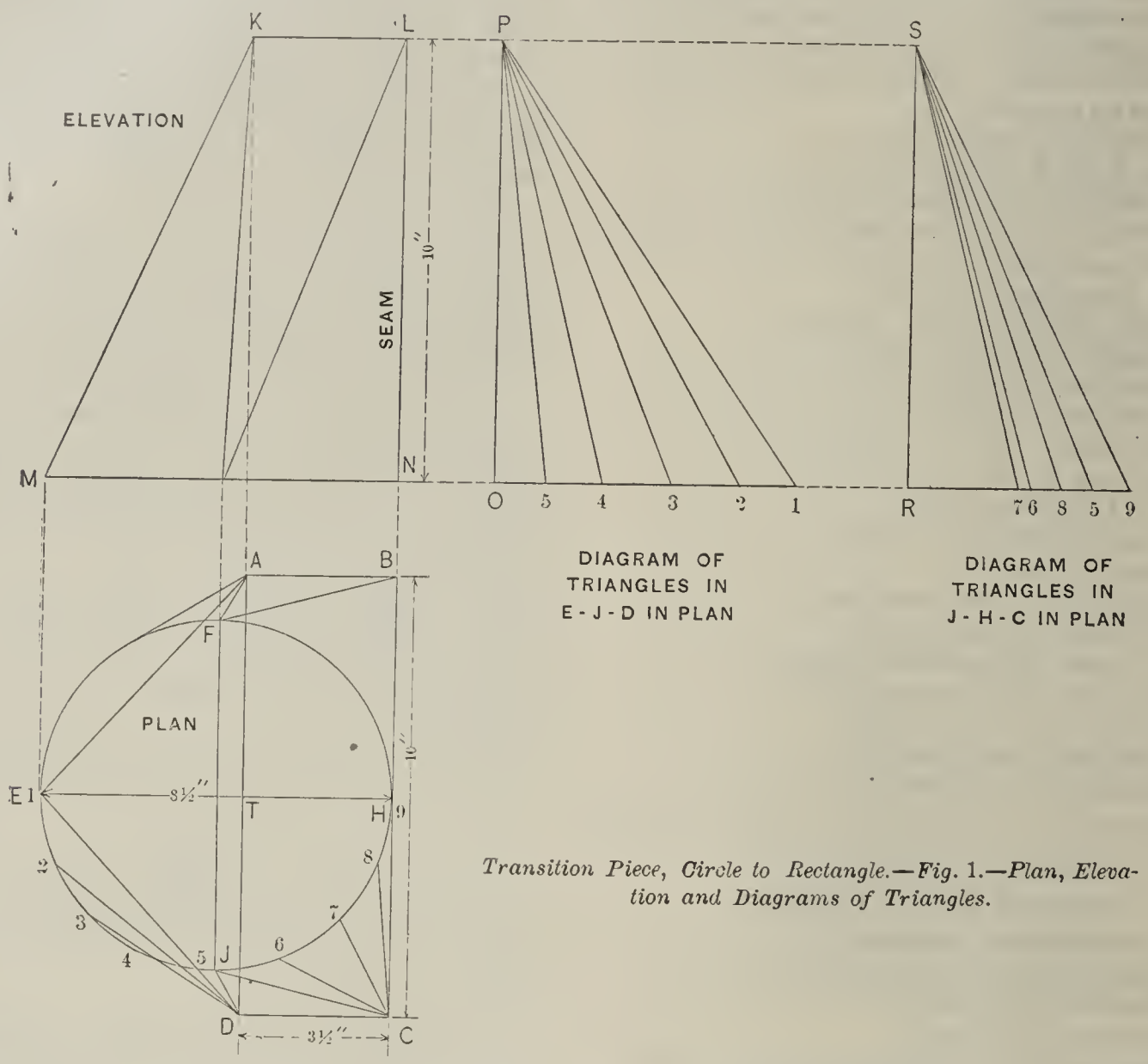
Robert L. Oman, plumbing inspector of Newport, R. I., in his annual report states that he has made 385 inspections of plumbing work. He has found galvanized sheet iron pipe used for the waste in connection with a number of fixtures, and recommends that a clause be inserted in the plumbing regulations to prevent its use in future. During the year 202 plans for plumbing work were filed in his office for work amounting to $40,137.

Articles incorporating the Detroit Valve & Washer Company, Detroit, Mich., have been filed. The capital stock is $10,000, of which $8000 is paid in. The stockholders, all of Detroit, are as follows: James C. McIlroy, 400 shares; Horace G. Lobenstine, 399; Wm. H. McBryan, 1 share.

SHEET METAL WORK.

TRANSITION PIECE, CIRCLE TO RECTANGLE.

A correspondent asks us to publish in *The Metal Worker* the best method for obtaining the pattern for a transition piece from circle to rectangle, a plan and elevation being shown in Fig. 1, which we reproduce from his sketch. A B C D shows the plan of the rectangular top on the line K L and E F H J the plan of the round base on the line M N in elevation. K L N M shows the elevation of the article, being 10 inches in hight, while the horizontal measurements are shown on the plan. Through the center point of the circle in plan draw the horizontal line E H and the vertical line J F, intersecting the circumference of the base at the points E, F, H and J. From these points draw lines to the corners of the rectangle, as shown by E A and A F, F B and B H, H C and C J, and J D and D E. Now divide the half circle shown by E J H into equal spaces, as indicated by the small figures 1 to 9. From these points draw lines to the corners of the rectangular top, as shown by solid lines 2 D, 3 D, 4 D and 5 D; also draw lines 5 C, 6 C, 7 C, 8 C and 9 C, which will represent the bases of the triangles which will be con-



Transition Piece, Circle to Rectangle.—Fig. 1.—Plan, Elevation and Diagrams of Triangles.

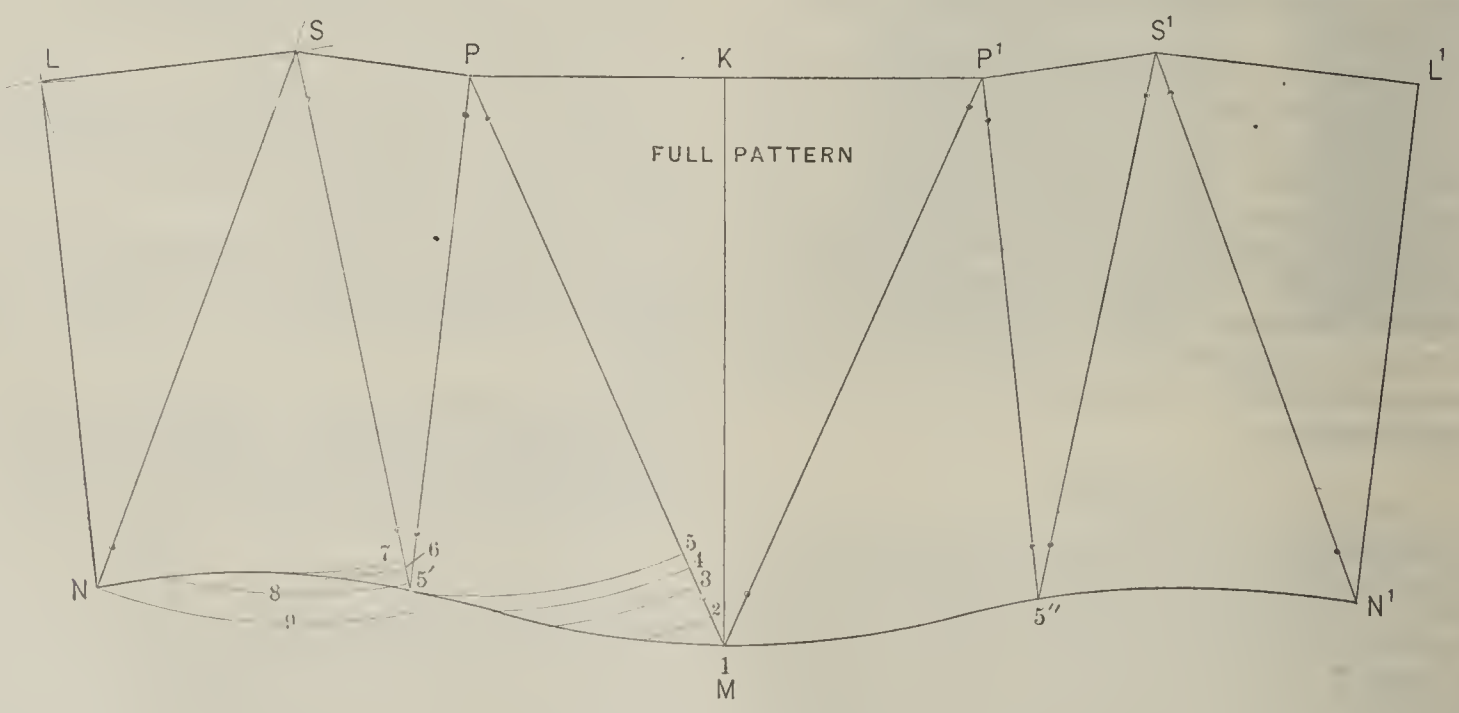


Fig. 2.—The Pattern Shape.

structed for use in the development of the pattern. Equal in hight to L N draw the vertical line P O. At right angles to P O draw the line O 1. Now take the various distances from D in plan to points 1, 2, 3, 4 and 5 and place them as shown from O to 1, 2, 3, 4 and 5 in the diagram of triangles. From these points draw lines to the apex P. Then will these lines represent the actual distances taken on corresponding lines in plan in E J D. In the same manner, equal to L N in elevation draw the vertical line S R. At right angles to S R draw the line R 9, upon which set off the various distances from C in plan to points 5, 6, 7, 8 and 9. From these points draw lines to the apex S, which will represent the actual distances taken on corresponding lines in plan in J H C.

For the pattern proceed as follows: Assuming that the seam is to come at the point H in plan, or L N in elevation, draw any vertical line. K M of Fig. 2, equal to K M in elevation, Fig. 1. At right angles to K M, Fig. 2, draw the line K P, equal to T D in plan, Fig. 1. Draw a line from P to M in Fig. 2. Now with P as center, and the various hypotenuses P 1, 2, 3, 4 and 5 of Fig. 1 as radii, describe arcs shown by 1, 2, 3, 4 and 5 in Fig. 2. Now set the dividers equal to the distance 1 to 2 or 2 to 3 of the plan, Fig. 1, and commencing at the point 1, or M, in Fig. 2, step from 1 to arc, then 2 to 3, to 4 and to 5. Draw a line from 5′ to P. Now with P as center, and D C in plan, Fig. 1, as radius, describe the arc S of Fig. 2. Then with 5′ as center, and S 5 in the diagram of triangles, Fig. 1, as radius, describe an arc intersecting the arc S in Fig. 2. Draw a line from 5′ to S. Now with S as center, and the various hypotenuses S 5, 6, 7, 8 and 9 of Fig. 1 as radii, describe arcs shown by 5′, 6, 7, 8 and 9 in Fig. 2. Now set the dividers equal to the spaces contained in the half circle in plan, Fig. 1, and commencing at 5′ of Fig. 2 step to arcs 6, 7, 8 and 9, as shown. Draw a line from N to S. Now with N as center, and N L in elevation, Fig. 1, as radius, describe the arc L in Fig. 2. Then with S as center, and C H in plan, Fig. 1, as radius, describe an arc intersecting the arc L in Fig. 2. Draw a line from L to N and trace a line through points of intersections on the arcs 1 to 9, as shown from N to M. Then will L S P K M 5′ N be half the pattern. Trace the other half opposite the line K M, as shown. Then will L L^1 N^1 N be the full pattern.

AMERICAN ROOFING SLATE IN 1897.

Although falling short of the expectations formed for it at the beginning of the year, the roofing slate trade of the United States in 1897, taken as a whole, was not unsatisfactory to the producers and dealers. The total volume of business done was about on a par with that of the previous year, but the prices obtained for the product were more satisfactory, leaving a better margin of profit than was the case in 1896. The disappointing feature of the year's business was a marked falling off in the domestic consumption, due to the slackness which prevailed in the building industry. This was offset, however, by a remarkably heavy foreign demand, which nearly trebled the exports of American roofing slates as compared with those of 1896. Continued scarcity of Welsh slates in the European market, owing to the prolonged strike at the great Penrhyn quarries, and the high prices ruling on the other side of the water combined with an unusually active demand for the material abroad to stimulate the sale of American slates in Europe, with the result that the total output of roofing slates in this country fully equaled that of 1896, notwithstanding that the shipments from quarries for home use showed a radical decline.

Through the courtesy of John Galt, head of the well-known slate dealing and mining firm of John Galt & Sons, New York and Chicago, who, from his long and extensive experience in the trade, is probably as high an authority on slate matters as any one in the United States, we are enabled to present some interesting statistics of the output and exportation of roofing slates last year. These statistics were carefully compiled by Mr. Galt from information secured from official and private sources and fairly represent the actual figures for the year. The figures relating to shipments from the Pennsylvania and Vermont quarries are official, having been obtained from the records of the transportation companies, while the shipments from other points are estimated from reliable data received from the quarries. The statistics are as follows:

Shipments to tidewater at Philadelphia, Baltimore, Hoboken, Jersey City and Newport News (representing exports) from January 1 to December 31, 1896 and 1897:

	1896. Tons.	1897. Tons.
From Northampton County, Pa., including the Bangor and Pen Argyl region	18,196	38,038
From Lehigh County, Pa., including Lehigh quarries	15,585	18,000

Shipments to points in the United States for domestic consumption:

	1896. Tons.	1897. Tons.
From Northampton County quarries	84,992	75,184
From Lehigh quarries	55,097	48,827

Shipments from Vermont quarries both for domestic consumption and export:

	Tons.
1896	96,400
1897	90,107

Shipments from other quarries in 1897:

	Tons.
Peach Bottom, York County, Pa	6,000
Maine	5,000
Buckingham County, Va	4,000

This gives a total output of 285,156 tons.

The total 1897 output of roofing slates in squares, from all sections, was in round figures as follows:

	Squares.
Bangor, Pa	175,000
Pen Argyl, Pa	130,000
Slatington, Pa., Lehigh section	120,000
Chapman, Pa	25,000
Peach Bottom, Pa	25,000
Virginia	15,000
Vermont (including sea green, unfading green and variegated)	250,000
Brownsville and Monson, Maine	25,000
Total	765,000

It is impossible to give the correct number of squares of roofing slate exported, or the actual value of the slate when shipped at United States ports, the records being kept in values and not in tons. The values, moreover, are calculated variously at the different ports of shipment, some being the value here and some the value at destination. Mr. Galt has arrived, however, at an estimate of the amount of tonnage by calculating three and three-quarter squares to the ton, and the value at destination with 10 per cent. added for insurance. In this way he gets the following figures, which illustrate the extraordinary gain in the amount and value of exports of American roofing slates during the past two years:

Total export shipments of roofing slate from the United States, 1895-1897:

1895.— 2,275 tons, valued at	$40,952
1896.—18,145 tons, valued at	326,573
1897 (to November 30).—48,800 tons, valued at	873,342

These export shipments were made almost wholly to the United Kingdom, going principally to London, Cardiff, Manchester, Bristol, Dublin and Liverpool, although some good sized orders were filled for Hamburg, Germany. The home market is found mainly in Ohio and further West, probably half of the total amount being consumed in the State of Ohio. The South also took a fair share of the domestic shipments, the city of New Orleans, La., being a large consumer of roofing slate.

The outlook is regarded as favorable for a very good year's business in 1898, both as to volume and prices. The foreign demand keeps up in good volume and seems likely to continue for some time longer, as there is still a pronounced shortage of roofing slate on the other side of the water, and the Welsh quarries are so well booked up that they are refusing orders for deliveries within six months or more. Moreover, the price of Welsh slate is relatively much higher than that of the American product delivered in the United Kingdom. Stocks in the United States are low, too, especially in the larger sizes, which are decidedly scarce, and prices are quite strong with something of an upward tendency. The amount of building in contemplation in the slate using districts is large,

and there are grounds for anticipating an increased demand for this roofing material during the present year of from 25 to 50 per cent. over that of 1897.

IRON ROOFING ASSOCIATION.

The twelfth annual meeting of the National Iron Roofing Association was held at the Grand Hotel, Cincinnati, Ohio, January 18 and 19. The first day's business was devoted exclusively to the work of the various executive committees, the real business of the meeting being transacted on the last mentioned date. The industry was represented by the following firms, viz.:

American Corrugating Company, St. Louis, Mo:, by H. P. Lloyd.

American Steel Roofing Company, Cincinnati, Ohio, by Geo. M. Verity.,

Ætna Standard Iron & Steel Company, Bridgeport, Ohio, by W. H. Eaton.

Chas. H. Connor & Co., Louisville, Ky., by E. H. Connor.

Chattanooga Steel Roofing Company, Chattanooga, Tenn., by J. E. Annis.

Cincinnati Corrugating Company, Piqua, Ohio, by J. G. Battelle and J. H. Frantz.

Cambridge Roofing Company, Cambridge, Ohio, by J. B. Outland and H. C. Hornbrook.

Garry Iron Roofing Company, Cleveland, Ohio, by Geo. E. Needham.

Globe Iron Roofing & Corrugating Company, Cincinnati, Ohio, by A. L. Andrews.

Gedge Bros., Anderson, Ind., by B. H. Gedge.

Hyndman Steel Roofing Company, Cincinnati, Ohio, by R. J. Hyndman.

W. A. List & Co., Wheeling, W. Va., by W. A. List.

St. Louis Corrugating Company, St. Louis, Mo., by G. A. Banantine.

E. E. Souther Iron Company, St. Louis, Mo., by A. G. Souther and F. E. Codding.

New Philadelphia Iron & Steel Company, New Philadelphia, Ohio, by H. D. Westfall.

American Tin Plate Machine & Mfg. Company, Canal Dover, Ohio, by S. Y. Buckman.

T. C. Snyder, Canton, Ohio.

A large number of letters were received by the secretary from those unable to be present, expressing their regrets.

The morning session was entirely taken up with the appointment of various committees and the discussion of details having for their basis the betterment of trade conditions. One of the principal features of the discussion was the use or adoption of a specific paint formula, the object being to adopt a uniform weight, quantity and quality. Prices were also dwelt upon, it being the consensus of opinion that in view of a reasonable certainty of an advance in raw material producers of roofing must of necessity ask a corresponding advance in the finished product, and that in the very near future, too. The meeting closed with the election of the following officers, to serve during the ensuing year, and the formation of an Executive Committee:

Geo. E. Needham, Cleveland, Ohio, *president.*

E. E. Souther, St. Louis, Mo., *vice-president.*

Geo. M. Verity, Cincinnati, Ohio, *secretary and treasurer.*

EXECUTIVE COMMITTEE.

Alex. Glass, Wheeling, W. Va.
E. Langenbach, Canton, Ohio.
J. G. Battelle, Piqua, Ohio.
J. E. Annis, Chattanooga, Tenn.
A. L. Andrews, Newport, Ky.
H. C. Hornbrook, Cambridge, Ohio.

John Galt & Sons, the well-known wholesale dealers in Roofing Slate, with offices at 253 Broadway, New York, and 915 New York Life Building, Chicago, have made a new departure in the issuing of their price list of American Roofing Slate for January, 1898, in the form of a small booklet of 20 pages. In addition to the net prices of all kinds of Slates, a considerable amount of useful information is presented in the publication, including tables of weights and sizes, freight rates, details as to the various qualities and descriptions of Roofing Slate, price-list of Slaters' Supplies, with illustrations of tools needed and other information useful to roofers and contractors.

Change in Firm Name.

The firm of Rhodes, Dickelman & Co., manufacturers of iron and steel roofing, galvanized eave troughs, conductor pipe, &c., at Forest, Ohio. whose term of partnership expired January 1, 1898, by limitation, have been succeeded by the Dickelman-Bowers Mfg. Company, with J. L. Dickelman of the old firm in charge of affairs as general manager, L. S. Dickelman as secretary and F. M. Bowers sales manager, both of the latter gentlemen having for years been with the old firm also. The new firm are adding a number of specialties to their already extensive line of sheet metal supplies and desire to assure the trade that it will be their constant aim to furnish the same courteous attention, prompt service and high grade products as in the past.

The new firm will continue the former force of salesmen, and with the exception of change in firm name and increased facilities for serving their customers, will make no change in the conduct of the business. In addition to the line of specialties manufactured, they will also job a full line of tin plates, solders, copper, rivets, black and galvanized sheets and general sheet metal supplies.

FLASHINGS.

The Wheeling Corrugating Company, Wheeling, W. Va., manufacturers of Corrugated Iron, Steel and Tin Roofing, advise us that the statement that they would erect a Black Plate mill is without foundation. They do not contemplate any additions to their plant at this time.

The Newport Cornice & Furnace Company have been incorporated at St. Louis, Mo., with a capital stock of $5000, by Ellen J., Mary I., John J. and Lawrence S. Newport.

The Kinnear & Gager Co., Columbus, Ohio., have been enjoying a splendid trade on their specialties, Sheet Metal Ceilings and Rolling Iron Shutters, Partitions, &c., for some time past. Of the former, shipments have been made recently to San Domingo, Honolulu and Mexico. The company are supplying their larger forms of Shutters or Partitions with motors for greater ease of operation.

The annual meeting of the Bangor Slate Roofers' Association was held at Bangor, Pa., on January 19. Fifty operators were present. The election of officers resulted as follows: President, Elkanah Drake of Newark, N. J.; vice-president, William Bray of East Bangor; secretary and treasurer, Thomas Ditchett of Bangor; inspector, Horatio Miller of Bangor. Executive Committee: R. S. Brown of Easton, Cotton Amy and James Masters of East Bangor.

Denis J. Whelan, Troy, N. Y., since assuming the business which includes the manufacture of the Capitol Gutter Former has notably improved the machine to the extent that it is now more durable, simple and rapid in operation. The present capacity of the machine is 1000 feet of perfectly formed gutter per hour, instead of 600 feet as heretofore, while the rolls now in use in the Capitol Gutter Former are of tubular steel.

Charles Hemje, 87 Main street, Annapolis, Md., has recently secured a patent on a heater for which he claims a number of important advantages. The heater consists of three cylinders forming two annular spaces, the outer one of which is closed at the top and bottom and provided with suitable means for the admission of the products of combustion into this outer annular space, while by means of the inner cylinder a forced circulation through the inner annular space is produced, the cold air being taken from the floor and discharged at the top through a circular opening. These heaters can be used with any stove, including a cook stove, and as the heating is done entirely by the waste chimney heat it accomplishes, the inventor claims, a great saving in coal. There are other advantages claimed for this device, the patent for which Mr. Hemje is seeking to dispose of by sale or lease of State rights, as explained in an announcement elsewhere.

Paul du Chaillu, the famous African explorer and hunter, will lecture on Tuesday, January 25, at 8 p.m., in the Auditorium of the New York Trade School, Sixty-seventh street and First avenue, on "The Great Forest of Equatorial Africa." The lecture, which will be illustrated by numerous stereopticon views, is open to the public without charge. Tickets can be had on application to the New York Trade School. This is the second illustrated lecture of the present series. Announcement of the third lecture will be made shortly after February 1.

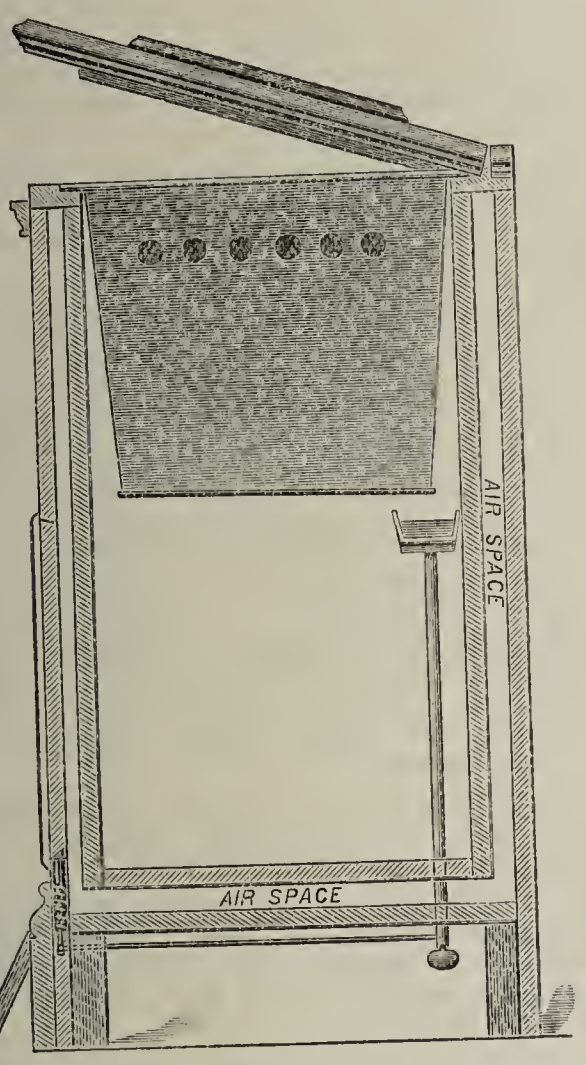
THE RETAIL STORE.

CONSOLIDATION OF ENAMELED WARE MAKERS.

The proposed enameled ware consolidation seems to have resolved itself into a combination of four large concerns—namely, the St. Louis Stamping Company of St. Louis, Mo.; the Central Stamping Company of New York, Kieckhefer Brothers Company of Milwaukee, Wis., and Matthai, Ingram & Co. of Baltimore, Md., three of which firms are makers of enameled ware and one of tinware. It is understood that the concerns named have definitely decided to consolidate their business. Other firms which were at one time expected to join the combination have, for one reason or another, drawn out of the scheme, mainly, it is said, on account of differences of opinion in regard to the valuation of their plants. A meeting of the interests involved in the consolidation is to be held in New York on Monday, where the final arrangements are expected to be consummated.

New Columbia Refrigerators.

Cooper & McKee, 119 Gwinnett street, Brooklyn, N. Y., in their new Columbia hardwood refrigerators embody certain improved features that will interest the trade. Fig. 1 is a sectional view of the refrigerator, showing the ice chamber and the arrangement of the automatic siphon. Fig. 2 is a broken view of the ice chamber showing its



New Columbia Refrigerators.—Fig. 1.—Sectional View through Refrigerator.

construction and the method of air circulation provided for, while Fig. 3 is an enlarged detail view showing the siphon connection. Referring to the removable ice chamber, which can be lifted out for cleaning or other purposes, and put in without the slightest difficulty, it will be seen that there are no fittings or intricate parts. It is made of heavy galvanized steel with holes stamped through the bottom and around the top for air circulation. The openings in the bottom, which are thrown up with a slight flange on the inside to prevent condensation dropping down through them, are covered with a corrugated rack to further prevent any drip to the food chamber below. The waste water and any condensation goes into the gutter on the back, which is also removable, and through the pipe and automatic siphon to the pan placed beneath the refrigerator. Referring to Fig. 3 the general operation of this automatic siphon will be understood. Its operation

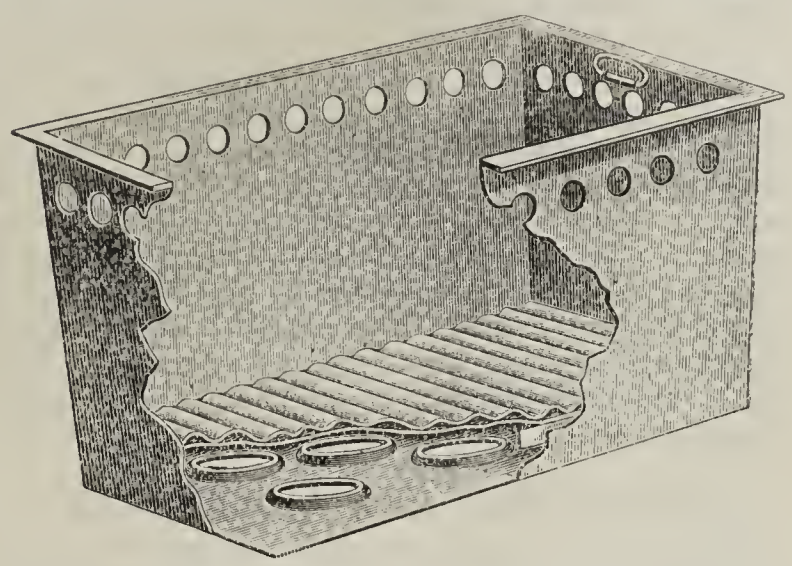


Fig. 2.—Broken View of Ice Chamber.

by the opening and closing of the door is simple and positive. It is fastened to the bottom of the refrigerator and connected by a lever to a pin going through the sill and held in position by the door when the latter is closed. On opening the door it drops, emptying any accumulated water, and closing the door returns it to its proper position, when the drip from the ice makes a seal preventing the entrance of warm air and retaining the cold air in the refrigerator. In referring to their refrigerators, Cooper & McKee say that this season they have discarded the use

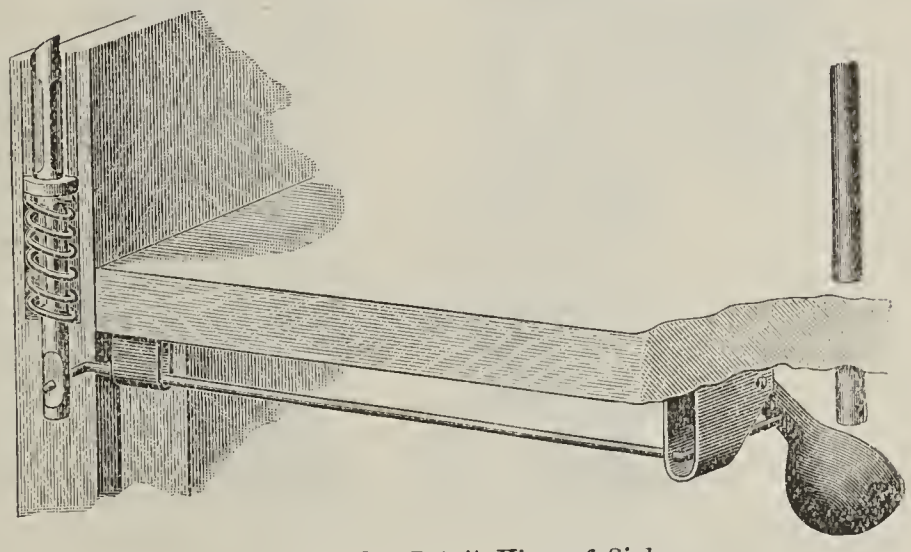


Fig. 3.—Detail View of Siphon.

of charcoal because of its dirtiness and liability to sift out, and have used the modern style of insulation with wool, felt or plaster boards and charcoal sheathing, which always keeps its position and is air tight. The company, since last season, have built another four-story warehouse, giving them unexcelled storing facilities and enabling them to make prompt shipments of all sizes.

Reading Stove Dealers' and Metal Workers' Association.

The annual meeting of the Stove Dealers' and Metal Workers' Association of Berks County, Pa., was held on the evening of Thursday, January 13, at Barbey's Café, Reading. The report of the treasurer made a very flattering showing. The election of officers resulted in the following:

President, Frederick H. Kneipe.
Vice-President, John L. Fett.
Secretary, Geo. G. Ritter.
Treasurer, M. J. Snook.
Auditing Committee, George Hauck, L. W. Dundore, Henry Lewis.

After the business meeting had been concluded a ban-

quet was held, the toastmaster being Mr. Barto of the Abram Cox Stove Company of Philadelphia.

I. E. Palmer.

I. E. Palmer, Middletown, Conn., the well-known manufacturer of Hammocks, Crinoline Linings, Mosquito Netting, Canopies, &c., is now giving special attention to the requirements of large buyers in this line. Mr. Palmer has lately put on the market an innovation in Hammocks which is styled the Utopia, of which a full description was given in *The Metal Worker*, January 1. This Hammock is a radical departure from the styles with which the trade are familiar and is offered as superior to any other on the market, and an improvement on his well-known Arawana. The peculiar construction of the Utopia permits its use in a number of positions varying from a sitting position to a sleeping position, the adjustment being easily and quickly effected. The 1898 catalogue of Mr. Palmer gives an idea of the completeness of the line of goods he is manufacturing, including as it does Canopy Fixtures and Attachments, Window Screen and Piano Cloth, Hammock Suspension Devices, &c., in addition to the lines mentioned above. An assortment of School Bags is also shown.

Hermance Non-Spilling Safety Lantern.

Glens Falls Lantern Company, Glens Falls, N. Y., are manufacturing the Hermance Safety Tubular Lantern, illustrated in Figs. 1 and 2. Fig. 1 shows the method of removing the chimney to clean it or light the burner.

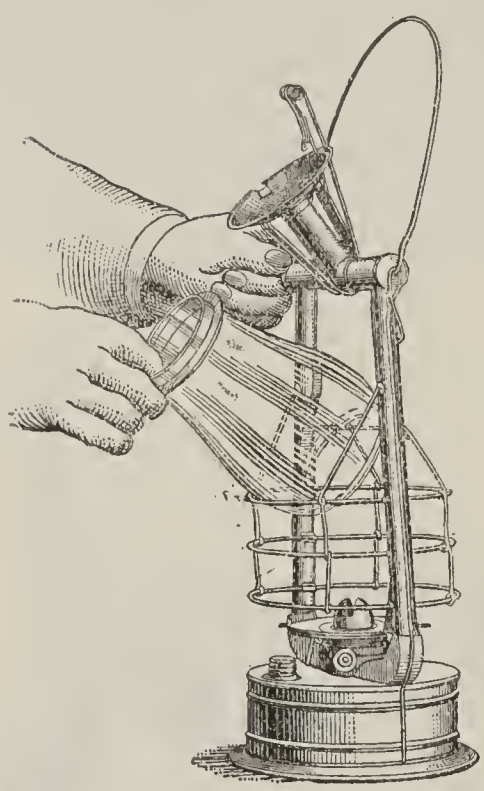


Fig. 1.—Non-Spilling Safety Lantern. —Removing Globe.

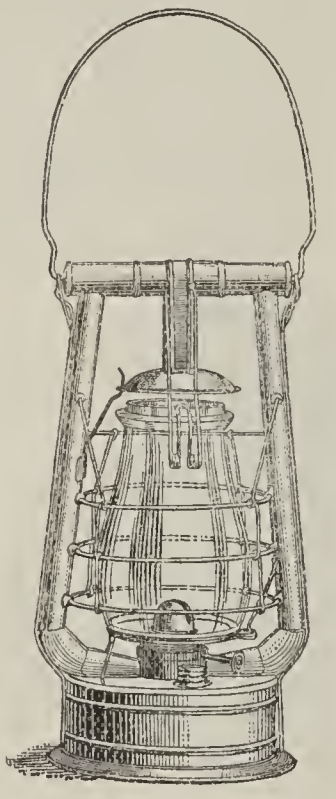


Fig. 2.—Lantern Ready for Use.

The lanterns are made of heavy stock, and the air tubes are large for admission of air to burner. The lantern is equipped with the Hermance non-spilling oil reservoir, which is said to keep the oil in the fount even if the lantern is upset, while upsetting the lantern when lighted, it is stated, causes the flame to be extinguished. The lantern here represented is known as the Hartford, single top, the company also making a similar lantern known as the Boston pattern with double top. We are advised that both patterns have been indorsed by the Factory Insurance Association, Hartford, Conn. A similar lantern for general use sold for a less price is made without guards. As will be seen by the cuts, the globe is readily removed for lighting or cleaning, while the burner may be as easily taken off by pressing a brass spring fastened to the side tube at the bottom of the lantern.

Ochsner & Orcutt Company, Sioux City, Iowa, have purchased the stock of Burns & Hunt of that city, which will shortly be removed to their large double store at 1010 and 1012 Fourth street. They are now remodeling the premises and putting in new and elaborate fixtures which will make the store an attractive and convenient one. The company's lines will comprise Builders', Shelf and Heavy Hardware, Stoves and Tinware, Bicycles, Sporting and Athletic Goods, Gun and Bicycle repairing, Stoves, Tin and Furnace work, &c. Their business is both wholesale and retail.

MEMORANDA.

Thomas B. Benson, many years ago one of the prominent stove merchants of Wilmington, Del., died recently at his residence after a lingering illness, aged 76 years. He was a member of Lafayette Lodge, A. F. A., F. A. M., and Delaware Lodge, I. O. O F. The funeral services were in charge of Lafayette Lodge, and the interment was at Newark Union Cemetery.

An error was made last week in noticing the new Refrigerator catalogue of the Dillingham Mfg. Company. They are located at Sheboygan, Wis., and not Michigan.

John Richey & Son succeed the firm of Wheeler & Richey, at Palestine, Ill., in the Stove and Hardware business. The new firm will erect a new building for their business as soon as the spring opens.

Geo. W. Brown, Jr., dealer in general Hardware, Stoves and Ranges, Hillsboro, Ill., has bought the Paden & Wilson stock of Farm Machinery, Buggies, Wagons, Pumps, &c., and intends to make this line a permanent addition to his stock. Mr. Brown would appreciate catalogues and other printed matter relating thereto.

E. B. Sutton, Whiteside, Ontario, Canada, dealer in Hardware, Stoves, Musical Instruments, &c., would like to receive catalogues, calendars, &c., covering general Hardware, Electric Machinery, &c., with information as to prices.

Nice & Hinkey, dealers in Hardware, Stoves, Tinware, Engineers' Supplies, Fittings, &c., Tonawanda, N. Y., advise us that they have no connection with a company somewhat similar in name, against whom a foreclosure suit is pending, the two concerns being entirely distinct.

George W. Graham, 28 Warren street, New York, has recently been appointed selling agent for the W. E. Thayer Mfg. Company, Williamsburg, Mass., for the Eastern territory lying between Philadelphia and New Haven, Conn., including both of those cities. This company, established in 1840, are manufacturers of a line of fine Tools and House Furnishing Goods, including Screw Drivers, Mincing and Kitchen Knives, Ice Mallets, Cake Turners, Awls, Nail Sets, Center Punches, Reamers, Countersinks, together with a number of kindred small articles. Later when the wants of this territory have been determined, Mr. Graham will carry a stock of goods for executing hurry orders.

Tobias Bros., retailers of Hardware, Stoves, &c., 1423 Main street, Peoria, Ill., have sold out to L. D. Putney. Mr. Putney expects shortly to increase the stock thus acquired.

Lane & Co. have lately opened up a new store in Lanes, De Witt County, Ill. They are carrying a stock comprising Shelf Goods, Tinware, Sporting Goods, &c.

C. E. Brigham has succeeded Brigham & Lyon in the Hardware line in Wauseon, Ohio, Joel Brigham and Marcus Lyon having retired. Mr. Brigham has had entire charge of the business for the past ten years, so that the change is practically one in name only. Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sash, Doors, Glass, Paints, Oils, Bicycles, &c., are carried.

J. A. Marshall & Co., Manito, Ill., are making a number of improvements in their store, with a view to rendering it more convenient and attractive. They handle a large variety of goods, including Hardware, Tinware, Stoves, Implements, Seeds, Vehicles, &c.

J. C. Gafford has lately opened a new Hardware store at Salina, Kan. He is retailing Shelf and Heavy Hardware, Stoves, Tinware, &c.

Prowse & Pelton are successors to Prowse & Thomson in the wholesale and retail Hardware, Stove and Plumbing business in Herkimer, N. Y. The new firm are improving the interior of the store, making it more attractive and convenient

W. H. Chilson has purchased the Schneckloth Hardware stock in Garwin, Iowa, and will continue the retail Shelf and Heavy Hardware, Stove, Tinware and Sporting Goods business under his own name.

A. P. Cleland, dealer in Hardware, Steam Evaporators, Cane Mills, Pumps, &c., Macy, Ind., has put a new boiler in his machine shop, and is now better prepared than ever to repair boilers, engines, Bicycles, &c.

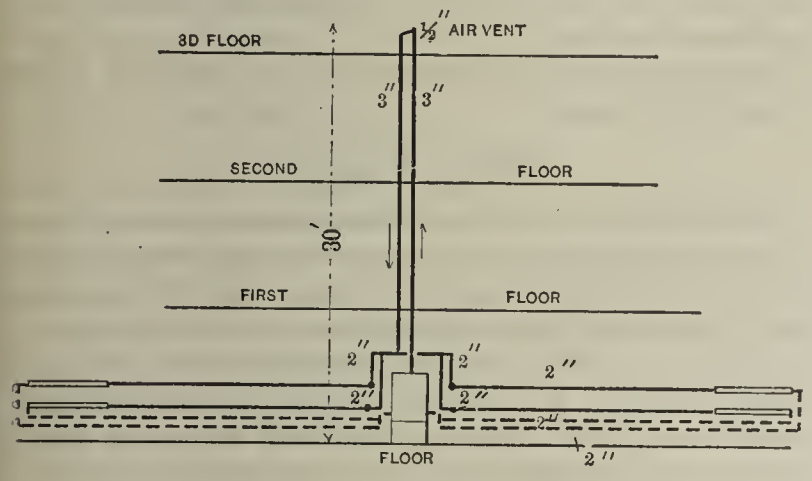
The recently completed warehouse of the Currie Hardware Company, Atlantic City, N. J., was destroyed by fire a short time since. The firm advise us that they are erecting a new store in which they will continue the wholesale and retail business in Shelf and Heavy Hardware, Stoves and Tinware and Plumbers' Supplies.

E. R. Hormel has succeeded Patrick & Hormel, retail Hardware, Stoves, Tinware, &c., Ulysses, Neb.

THE LETTER BOX.

Improving Circulation In a Hot Water Drier.

From W. C. O., Brooklyn, N. Y.—I would consider it a favor if you would give me your opinion upon the best method of improving the circulation in the apparatus outlined in the sketch sent herewith, Figs. 1 and 2 showing elevation and plan. The boiler cannot be lowered, neither can the coils be altered, as they run between endless rolls of paper in a drying machine. There are no



Improving Circulation in Hot Water Drier.—Fig. 1.—Elevation of Piping.

valves on any of the coils and both legs of the siphon are felted. I proposed to remove the felt from the drop leg of siphon and connect the return of the upper coils to the flow of the lower coils, thus compelling the water to pass through both coils. Is there any known way of erecting a plant of this kind under exactly the same conditions and without the siphon. The tenant has only one loft on the third floor of a building and finds a great deal of trouble in obtaining the permission necessary to run the siphon through other tenants' quarters. The flow outlet of boiler is 6 feet high, the return inlet 2 feet high, the upper coil 5 feet high, lower coil 30 inches high and the siphon 30 feet high, all hights being taken from the floor level.

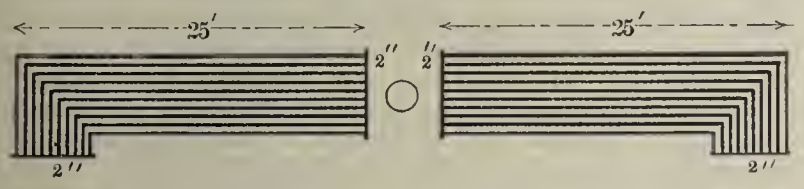


Fig. 2.—Plan of Piping.

The coils are 25 feet long and are made of manifolds and are laid on the side. They are miter coils with 2-inch return and 2-inch flow, and expansion tank is closed and works at 50 pounds pressure. The coils are graded perfectly, every pipe in the job having a grade of ⅛ inch to the foot. The main flow is 3 inches in diameter. The return outlets on the boiler are 2 feet high, and the return of lower coil runs in on a ⅛-inch grade to the boiler. The return of the upper coil was trapped 6 inches close to the boiler, evidently to check the circulation. I think it clears itself of air, however, as the boiler in filling expels the air back through the upper coil. There are no valves on any of the coils, as they are all operated at one time. The upper coil works well, but the lower one is very poor. I have examined the job very carefully and am unable to see any air pockets in the piping. The apparatus is used for drying purposes. Can you suggest any way of quickening the circulation on starting up, as it works better after it has been running a while ?

Answer.—The only point that would tend to make unequal circulation in the two tiers of coils is at the tee piece that feeds the lower coil. The size of the horizontal pipe that feeds the coils is not stated, but if it is the same size as the coil connections, it is a well-known law of a body in motion that it is disposed to continue in a straight line unless some force is applied to deviate or divide it. For this purpose the cross pipe from the 3-inch main should be large, say of the same size, 3-inch, with a tee piece 3 x 2 x 2. This forms a sufficient abutment to the motion of the water to give each outlet an equal pressure. The vent pipe from the top of the siphon may not carry away fast enough any steam that would reach that point by pushing the fire under the boiler for the supposed purpose of increasing the circulation. If steam remains at the apex of the siphon it will impede the circulation. There should be at that point a small chamber that would instantly give place to any steam that might rise to that hight and not allow it to choke the circulation, which it will do if it is carried into the down flow pipe. There is no better way for producing a good water circulation with the boiler on the same floor than the one our correspondent has. It is the main principle of the Baker car heater and works well when all the parts are well balanced. We do not recommend the removal of the felting. But changes to meet our suggestions as above will no doubt greatly improve the circulation and equalize the temperature.

Barstow Metal Lath.

From A. H. G. Hardwicke, 301 Main Street, Niagara Falls, N. Y.—Will some reader of *The Metal Worker* please inform me where the Barstow metal lath is manufactured ?

Steel Barrel Manufacturer.

From E. S., Kansas City, Mo.—Will some reader of *The Metal Worker* please tell me if there is such a thing as a steel barrel made, and, if so, what is the address of the company making it ?

Soft Solder for Metal Patterns.

From L. W. H., Ohio.—Can you give me a receipt for a good soft solder such as metal pattern makers use to put metal letters on patterns ?

Note.—We would be glad if some of our readers who are familiar with this work would supply the information asked for. In the meantime we will furnish a couple of receipts for soft solders taken from a reference book: A solder that melts at 180 degrees is composed of six parts of lead, one part cadmium and seven parts bismuth. Another solder, melting at 300 degrees, is composed of two parts of cadmium, two parts of lead and four parts of tin.

Tinners' Fire Pot.

From E. E. H., St. Louis, Mo.—Will *The Metal Worker* please inform me what is the best material, dimensions and shape for a tinners' soldering furnace to use charcoal for shop, and also for roofing in general outside work ?

Note.—We leave the answer to the inquiry of this correspondent to our readers. This is a season of the year when little is doing in the shop, and a discussion of the fire pot question, especially those adapted for indoor work and those adapted for outdoor work, with dimensions and sketches, will be interesting.

STOVE TRADE NOTES.

REVOLUTION AND EVOLUTION OF THE STOVE TRADE.

BY J. B. N.

The stove business has always been peculiar unto itself and not like the dry goods, flour, fruit, tinware or even hardware business. During the past seven or eight years it has been under the necessity of combining or cutting prices to the unprofitable line. Manufacturers of stoves have gone on in the even tenor of their way, doing their business quietly without fuss and making a fair and legitimate profit upon their sales, which, however, have not allowed any of them to live in the luxury that can be found in many other branches of trade that seemingly do not require any more brain or capital.

The stove trade weathered the panic of 1893 and hard and trying times since second to no other trade. It held its prices and did not go into that disastrous cutting found in other lines during those times to help tide concerns over difficult places. The tide of population moving West compelled some of our Eastern foundries to start branch foundries West in order to hold their trade and compete with Western foundries already there, as they could not manufacture in the East and freight the goods West and stand the competition. The firms who have done that have had the problem to solve of how, now that their production in their Eastern works was very materially curtailed, could they make the Eastern end pay. Running on quarter or half time they found was a losing operation, so after consulting and looking the field over very carefully one enterprising foundry decided they would make cheap goods for the masses and run full time and sell them at prices that would bring to them a large share of this trade. Of course this trade had been supplied satisfactorily before this foundry entered the field, so in order to capture the trade desired prices were cut on cheap grades of goods. They got what they were after, but hardly the result. It was not anticipated that very much attention would be paid to just one foundry doing that, but soon another loomed in the field from another direction, and then others and others, till now the competition and cutting of prices is absolutely ruinous to good business.

How has it affected the dealer? Is he the same? No; he, too, has had to change his method of buying. Where before he could buy about as he pleased, few or many, at about the same price, he finds now that if he will purchase a large quantity he can secure the minimum price, which always is an exceptionally low one, and he is consequently obliged to carry larger stock. Prices were kept normal all through the hard times, but now that good times are in sight the life is being cut out of prices in the struggle to get business. In this struggle only the strong who can fight and triumph in the "survival of the fittest" will be left to view the ruins.

It has now come to the stove trade to do and go through what other trades have gone through in the past seven or eight years—wipe out the weak and combine the strong; sell 12 stoves now at profit of four formerly; do three times the business and in the doing the devil catch the hindmost. It's the tendency of the period in which we live, that we must do more and get less than formerly. We must move faster, quicker. What was quick a year ago is slow to-day. Formerly a load of lumber was driven up to a building and unloaded by hand one stick at a time; now it is common to see the entire load hoisted up to the tenth or fifteenth story in less time than one stick could be handed up to the first floor before. The stove trade is new in this evolution and must think as it goes.

How about the credits when profits are so small?

How about the length of time allowed a customer to pay?

Are we burning the candle at both ends?

Has the retail dealer advanced as fast along these same lines as the foundryman? Does he not expect the same old concessions, and must they be granted?

Are the foundrymen being benefited by this change, now that good times are here?

Does not the retail dealer get the same retail price, and is he not the fellow who is getting all the money and fun out of the ruin?

We cannot make the weather cold or hot, but we can sell goods at a profit.

Henry Francis.

Henry Francis, a pioneer stove manufacturer of Spring City and Royersford, Pa., died on January 17, at his residence at Spring City, aged 78 years. In 1865 he organized the firm of Francis, Buckwalter & Co., proprietors of the Continental Stove Works, Royersford, from which he retired in 1874. Mr. Francis was also interested in the Spring City Bloom Works. He took an active part in religious and philanthropic work and was never married.

New Process Gasoline Stoves.

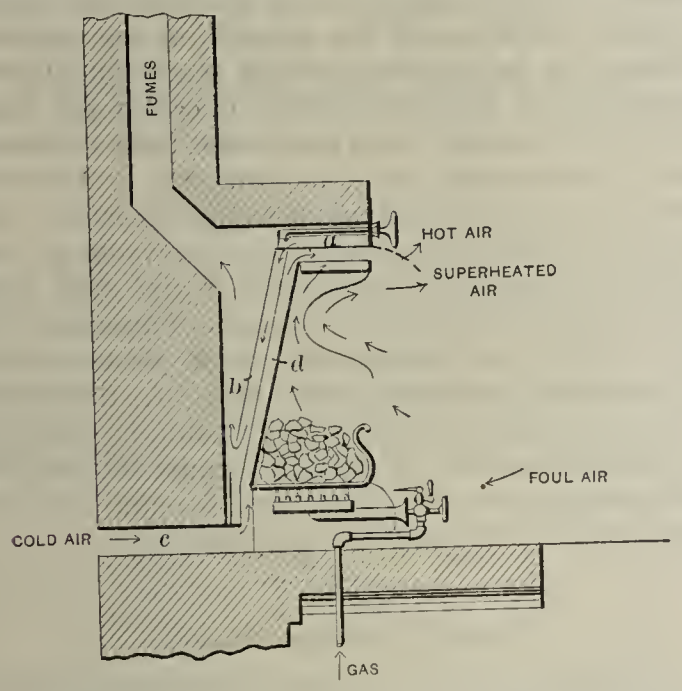
The trade literature which is being sent out by the Standard Lighting Company of Cleveland, Ohio, is of an exceedingly attractive character. A week or two since we referred to their circular of New Process blue flame oil stoves, and we now acknowledge receipt of a finely printed pamphlet of 32 pages, relating to their New Process gasoline stoves for the season of 1898. In this catalogue the company call special attention to the completeness in detail of the various lines represented, reference being made to them as "embracing the largest variety of latest improved gasoline cooking devices which inventive genius and manufacturers' skill have as yet been able to produce." The New Process vapor stove is described at considerable length, both as regards its operation, its design and construction and its improvements. The latter include an improved controllable sub fire which readily lights in cold weather; an improved self cleaning feed valve which can be adjusted by the fingers to control the feed, no pliers, wrench or other tools being necessary for the purpose; an improved and efficient heat collector, whereby the inflowing air is said to be more quickly and thoroughly heated and delivered to the evaporator with increased force, and finally an improved tank connection to permit of the valves and pipes being readily cleaned. The frame of the New Process vapor stove is referred to as strong and rigid, the top of ample width and provided with removable grates. The burner drums are of burnished brass, the burner caps being removable. The valves are provided with needles having non-corrosive points, and the reservoir is of such construction that it cannot be filled when the stove is in operation. The tank is provided with a float which automatically equalizes and regulates the flow of the gasoline so that, the manufacturers state, the tank works as well with a small amount of gasoline in it as it does when full. All parts of the stove exposed to the fire are of cast iron, and all stoves are equipped with shield in front of hot air pipes. The catalogue shows a number of styles and sizes in which the New Process is offered, together with several varieties of the Bell Junior generating stoves and Globe Juniors. An illustrated description is given of the 1898 New Process valve, the 1898 Bell burner, while extended reference, accompanied by illustrations, is made to different styles of ovens for use in connection with vapor stoves. The company announce that as their patterns are changed from year to year it is absolutely necessary to know the year the stove was made for which repairs are wanted, and they suggest that dealers make note of this when ordering. Several pages are devoted to ventilated broilers, mammoth globe incandescent lamps, New Process oil heaters, wall torches, &c. The printing is well executed on a good quality of paper, and the binding is in colored paper covers with embossed side title.

HEATING WITH GAS.

BY J. H. KINEALY.

On account of its convenience, cleanliness and rather low cost, gas has come to be much used for cooking in almost all towns and cities having gas plants. Great attention has been paid to the design and manufacture of gas cooking stoves and ranges, in order that they may be made to burn the gas with little loss and to utilize as nearly as possible all of the heat developed by the combustion. The result is that in many cities it is now cheaper to burn gas for cooking than it is to burn coal. And in those cities where the price of gas makes it somewhat more expensive than coal for cooking purposes the excess of cost of gas is more than outweighted by the comfort of using it in summer time and its convenience and cleanliness at all times.

While a great advance has been made in the use of gas for cooking, the advance in its use for heating has not been nearly so great. Most of the gas heaters that have been devised and put on the market have been of the class that discharge the products of combustion into the air of the room being heated. Such heaters, of course, use the oxygen in the room, and vitiate the air to such a degree as to make it unhealthful if breathed for a very long time. Such heaters are therefore not suitable for rooms that are to be occupied continuously, and which have no other means of heating and ventilation than the gas heater. But they serve admirably for bathrooms or other small rooms that are not occupied at any one time for a very long period, or for rooms which are only partially heated by the gas heater, which is lighted during but a small portion of the day. These heaters are much more economical than they would be if they did not discharge the products of combustion into the rooms being heated,



Heating with Gas.—Fig. 1.—*Section through Gas Grate.*

as by doing this they utilize every bit of the heat evolved by the combustion of the gas. They are advertised as using but a small amount of gas and as being extremely economical.

So far as the writer has been able to find, there are but few gas heaters on the market that do not discharge the products of combustion in the rooms being heated, but into a chimney. And it is for this reason that the paper on "Gas as a Fuel," read by F. Foveaux, mechanical engineer with the San Francisco Gas & Electric Company, San Francisco, before the Pacific Coast Gas Association, is so very interesting. In this paper Mr. Foveaux describes a grate and a hot air furnace to be used with gas as a fuel.

Fig. 1 shows the grate. It is seen that the products of combustion pass up through the basket of the grate into the chamber *a*, and from there pass through the duct *b* into the chimney The air for ventilation passes through the opening *c* in the wall into the duct *d*, where it is heated by the hot products of combustion, and then passes into the room.

The hot air furnace is shown in section in Fig. 2. It is 40 inches in diameter and 72 inches high, and has six 7-inch outlets for hot air. The casing is double, with a space of from 1 to 1½ inches between the outer and inner lining, and is made of galvanized sheet iron. Inside of the casing there are 61 radiator tubes, each 2 inches in diameter and about 48 inches long, made of No. 24 or 26 sheet

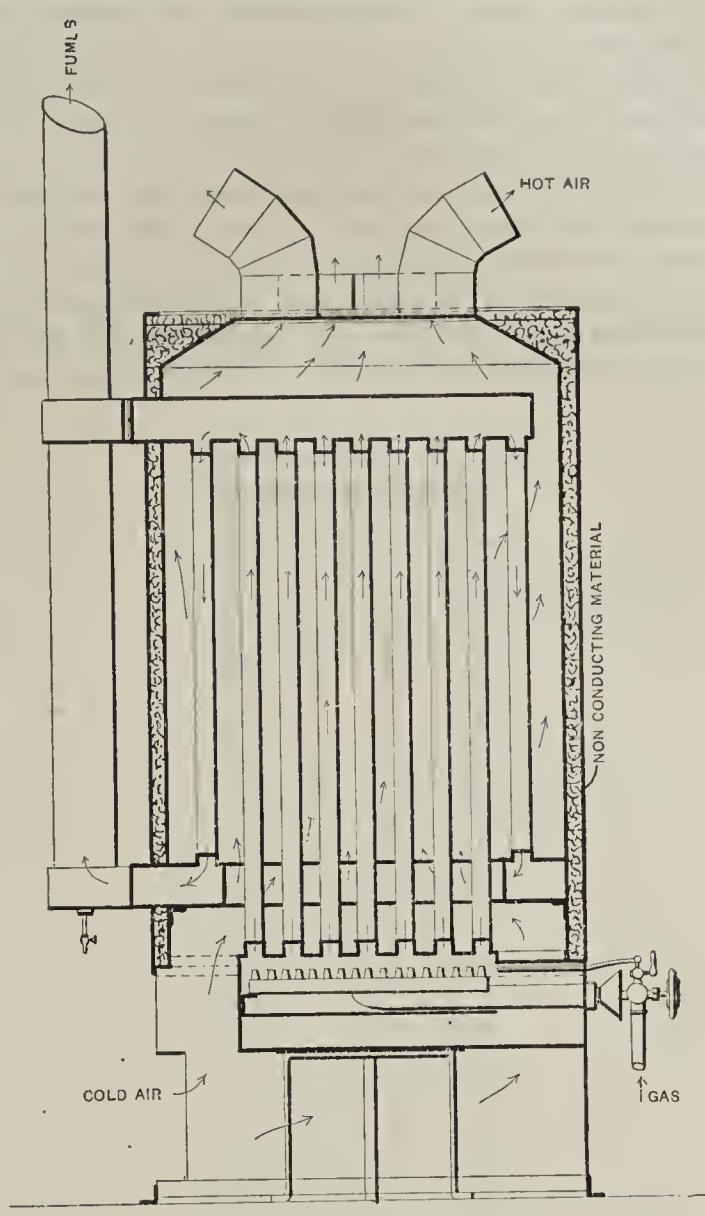


Fig. 2 —*Gas Hot Air Furnace.*

steel. As shown in Fig. 2, these tubes are connected at the top and bottom to hollow cast iron disks. The bottom disk contains the gas burners. The products of combustion pass up through the inner tubes into the top disk, and then down the outer tubes into a casting that is connected to the flue pipe. Cold air enters the casing at the bottom, and in rising to the top passes over the hot tubes and is heated by them. From the top of the casing the hot air is conducted by the hot air flues to the different rooms to be heated.

Mr. Foveaux says nothing as to the amount of gas that will be required for heating by the gas grate, but he says that "48 to 50 cubic feet of gas per hour will give the best satisfaction to heat six rooms" by the furnace. Of course "six rooms" is rather indefinite, and the amount of heat required to heat each will depend very much upon its size, exposure, and the kind and amounts of wall and window surfaces. We may, however, assume that six ordinary rooms are meant; that some have a north or west exposure and others have a south or east exposure; and that each room is about 14 x 14 x 10, and contains about 2000 cubic feet. On this supposition the six rooms would contain, in all, about 12,000 cubic feet. And if this can be warmed by the combustion of 50 cubic feet of gas per hour, it is evident that 1 cubic foot of gas is required per hour for every 240 $\left(\frac{12000}{50}\right)$ cubic feet of space in the rooms.

We may look at it still another way. The six rooms would probably require warming for 15 or 16 hours each day, and the gas used per day would be about 750 (50 × 15) cubic feet. The cost of this at 80 cents per 1000, which we pay in St. Louis for fuel gas, would be 60 cents $\left(\frac{80 \times 750}{1000}\right)$ and 60 cents per day would be $18 per month.

In the *Zeitschrift fur Heizungs, Luftungs und Wasserleitungstechnik* of November, 1896, there is a short article giving some of the results of experience with gas for heating schools in the southern part of Germany. The stove that was used, one of which was placed in each room, is shown in section in Fig. 3. It will be noticed that provisions are made for carrying off the products of combustion or fumes, for circulating and heating the air in the rooms, and for heating cold air introduced from the outside for ventilation. Just above the burner there is a cone shaped reflector which reflects heat down on to a polished cone reflector at the base of the stove. This last reflects the heat out into the room near the floor. It is stated that these reflectors aid very materially in preserving a uniform temperature throughout the rooms, and that when they were used there was a difference of but about 5 degrees F. between the temperature of the air at the ceiling and that of the air at the floor when the temperature at the ceiling was about 70 degrees. When gas stoves of a somewhat similar construction, but not provided with the reflectors, were used, it was found that when the temperature at the ceiling was about 70 degrees the temperature at the floor was only about 54 degrees.

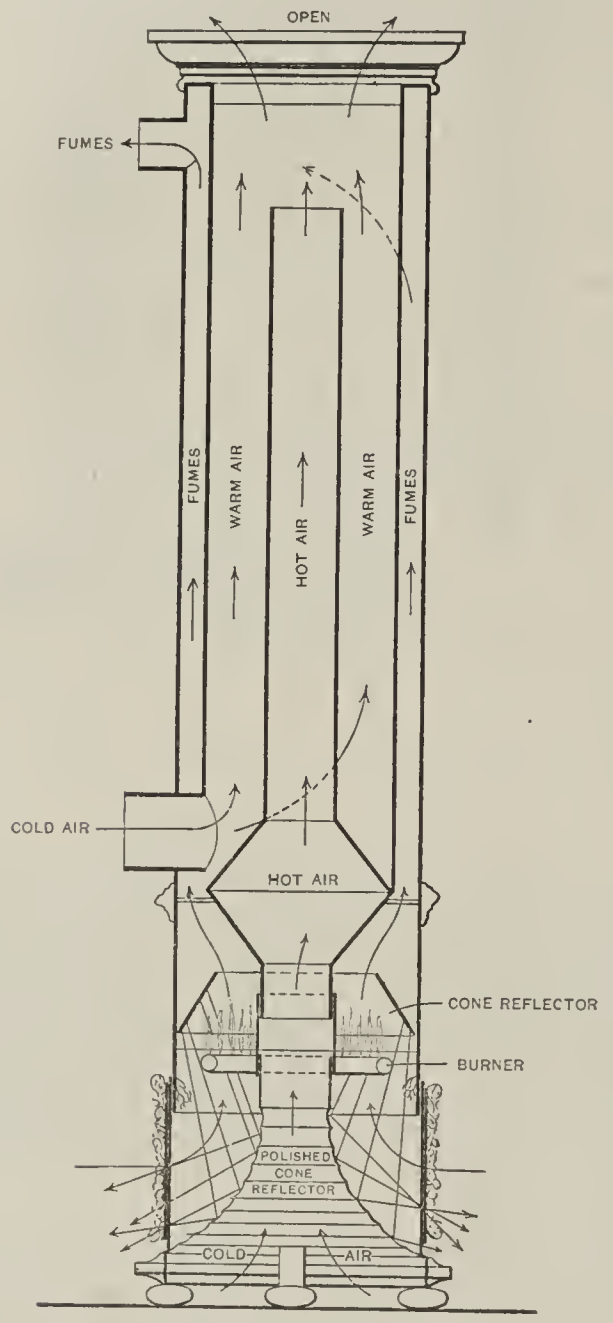


Fig. 3.—A German Stove.

From the data given in the article it is very difficult to arrive at the exact amount of space heated by the combustion of 1 cubic foot of gas per hour, as the number of hours the schools are heated per day is not given. It is stated, however, that about 31,000 cubic feet of gas were used to heat one room, containing about 7100 cubic feet, for the seven months from October 1 to April 30. It is probably safe to say that the gas stoves were in use eight hours per day for 26 days in each month, or 208 hours per month. Hence the total number of hours the stoves were used during the seven months is about 1456 (7×208). If we divide 31,000 by 1456 we get 21.3, which is the number of cubic feet of gas that was required per hour to heat a space of 7100 cubic feet. And if we divide 7100 by 21.3 we get 333, which is the number of cubic feet of space that was heated by burning 1 cubic foot of gas per hour. Then to heat six rooms, each containing 2000 cubic feet, there would be required about 36 $\left(\frac{6 \times 2000}{333}\right)$ cubic feet of gas per hour, or about 540 cubic feet per day of 15 hours. The cost of this at 80 cents per 1000 cubic feet of gas will be about 43 cents per day, or $13 per month.

Of course it is impossible to make any comparison, with the very meager data at hand, of the cost of heating by the furnace shown in Fig. 2 with the cost of heating by stoves similar to that shown in Fig. 3. It must be remembered that the costs given here are average costs per month for a season of about six or seven months; some months the cost would be much higher and other months much less. The kind and construction of the building, the thickness of its walls and its exposure are factors that would have a very important bearing upon the average cost per month of heating it by gas.

From what has been said it appears that when using gas at 80 cents per 1000 as a fuel, the cost of heating and ventilating six rooms, each about 14 x 14 x 10, would be somewhere between $13 and $18 per month. It is probable that the consumption of gas would have to be very carefully regulated in order to keep the cost down to $13 per month, and that is what most people would fail to do. The supply of gas to each stove or to the furnace would have to be regulated automatically to suit the requirements, in order to make the use of gas economical.

It is very much to be deplored that there is so little exact data obtainable as to the cost of heating by gas, as it is an important question, and one that is growing more and more important every day.

It ought to be possible to make a gas stove that would not discharge the products of combustion into the room, that would not occupy any more space than an ordinary hot water or steam radiator, that would not be unsightly, and that would permit the amount of air supplied for ventilation to be adjusted within reasonable limits. If one stove of this kind were placed in each room, and was provided with a small pilot light, kept lighted during the winter, a thermostat could be arranged so that the gas would be turned off or on as necessary to preserve a constant temperature in the room. Such a system of heating ought to be economical, and ought to give great satisfaction. The gas would be turned on and burned only when needed. When not needed the gas would be turned off, and the expense of heating would cease. At the beginning of the cold season the pilot light would be lighted, and then it would always be ready to ignite the gas when it was turned on, and the system would require little or no care or attention during the entire season.

Jewel Gasoline Stoves.

A beautiful catalogue of vapor stoves for the season of 1898 has been issued by George M. Clark & Co., 72 to 76 Lake street, Chicago. It comprises 40 pages of exquisitely fine letterpress and artistic engravings. The page is 7¼ x 8¾ inches in size, and therefore looks almost square. A cover of heavy paper is used, of a deep green color, which makes a good background for the embossed gold lettering and the Jewel Security trade-mark. The catalogue is printed in two colors, black for the letterpress and large cuts and chocolate for illustrations of burners, borders, head pieces, &c. The combination is effective and pleasing. The catalogue opens with views of the company's main offices in Chicago and their works at Harvey, which is a Chicago suburb. These works have 3½ acres of floor space and are admirably adapted to the purpose for which they are used. The company's manufacturing facilities are now unsurpassed.

The first stove to which attention is called is the Jewel Security, the new stove which they have been steadily working on for several years and have at last perfected. Its name indicates its character. The company claim that it leaves nothing to be desired for security in using gasoline for fuel. The immutable law of gravitation is relied upon for security instead of any mechanical device, which might at some time fail to act. For quickness of lighting, the 30 seconds or less in which this stove may be started are almost like turning a gas cock. The stove is free from odor at all stages of its operation and when the burners are turned out. It is built with a view to durability, and no needle valves are used. The Jewel Security

stoves are, in fact, gas stoves, as the gasoline is merely used in generating gas, and nothing but gas reaches the burners. The gas is heated and expanded before burning, and is therefore burned in the same state as that in which it is used in the Jewel Smokeless Generator stoves. This means that more heat units result from every gallon of gasoline than when the gas is used unexpanded and nearly cold. The Jewel Security stoves are made in two sizes. The larger size has three burners and a simmering burner on top with two burners on step, while the smaller size also has the step, but only two burners on top.

Next comes the Jewel Smokeless Generator. This construction has been on the market for some years and is one of the company's well tried and reliable products. On this principle they build a range in cabinet style and plain stoves in two sizes. The larger size has three burners on top, with an end step, while the smaller size has two top burners and step. The Jewel-Mammoth line is next in order. These stoves have smokeless burners having a large surface of flame. They are made in two hights of frame, 24 inches and 14 inches. The high stove is made in two sizes and the low stove in three sizes. The Jewel Junior line is then described. It is made in three sizes, individual burners being used. The Jewel Camp and Yacht stoves comprise two portable stoves, operated by air pressure secured by a hand bulb, and adapted to picnic or camping parties, yachting, &c. The Jewel-Acme line consists of a series of stoves furnished with the Jewel-Acme burner, which is an individual burner, smokeless in lighting and controlled by one needle. Constructions are shown with end steps, without steps, and in low stoves, 14 inches high, covering a full line. These stoves are made with lay down safety tanks or with stationary tanks, as desired.

Jewel Process stoves and ranges are last but by no means least. They are shown in several styles. The cabinet range presents a very handsome appearance. It has a horizontal tank, with valves independent of each other, removable and renewable valves, and a sub-flame which is designed to prevent flooding and secure perfect combustion. Step stoves are built on the same principle, with three and two burner tops, also a two-burner stove with no step. A number of pages forming the best part of the catalogue are devoted to supplies, such as Jewel baking ovens, steam cookers, toasters, broilers, flat iron heaters, waffle irons, automatic safety cans, &c. A strong point in connection with the Jewel stoves is that repairs of all parts can easily be obtained, as they are constructed on the interchangeable system.

Quick Meal Gas Ranges.

We are indebted to the Ringen Stove Company, St. Louis, Mo., for a copy of what is known as Catalogue No. 33, being a publication of 44 pages, bound in red paper covers, and illustrating and describing Quick Meal gas ranges, hot plates, gas furnaces, &c. In offering this publication to the trade the manufacturers present an announcement to their business friends to the effect that the new lines of Quick Meal gas ranges put upon the market during the last two seasons have met with very gratifying success, while the old ones have held their own. This, the company intimate, is good proof that their efforts to make the Quick Meal gas ranges perfect in every way are being duly appreciated. The catalogue shows a large variety of styles in which the Quick Meal gas range is offered, each illustration being accompanied by sufficient descriptive particulars to enable the dealer to obtain a good idea of the essential features of construction and claims made for the goods. Attention is also given to the Quick Meal upright broiler and water heater, and to a varied line of combination steel gas and coal ranges, running from a size adapted to the requirements of a small family up to those of a boarding house. The concluding pages of the catalogue are devoted to Quick Meal hot plates, gas furnaces, saucepans, bake ovens, broilers, sad iron heaters, waffle irons, toasters and Quick Meal gas burners.

"Twin Burner Gasoline Stoves and Ranges" is the title of a 32-page pamphlet, bound in paper covers, which reaches us from the Twin Burner Stove Company of St. Louis, Mo. The line of goods illustrated and described embraces, among others, Cabinet Process Stoves, which the manufacturers state have been greatly improved in appearance and serviceability and are offered in all styles and sizes. They are so constructed that the burner drums, which are of brass, hot air tubes and needle points are impervious to heat or rust. It is noted that the goods are new in design and elaborately nickeled, and being equipped with the Twin Burner patent odorless device are free from objectionable odor. Special reference is also made to the company's Jumbo Burner, which is said to be simple in operation and makes a very hot fire in proportion to the amount of fuel expended. The goods are shown in a variety of styles accompanied by brief descriptive text.

ODD PLATES.

The Progress Stove & Furnace Company of Springfield, Ohio, is the name of a concern recently incorporated at Columbus, that State, with a capital stock of $100,000. The directors of the company include S. W. Martin, T. D. Wallace, I. F. McNally, J. E. Adams and W. C. J. Randall.

The Toledo Stove Works of Toledo, Ohio, resumed operations January 4, with a full force of workmen, after a brief shut down for the usual inventory. We understand that the company closed a very successful year, the business for 1897 being stated to have been double that for 1896. The volume of orders now being received is of a very gratifying character and the prospects for a large output the ensuing year are considered good.

Isaac A. Sheppard & Co., Philadelphia, Pa., issue a somewhat novel announcement relative to the "warming of the house." This they say is not the least difficult problem connected with building a home, but is one which should be solved before the house is built. In fact, it should be planned while the house is going through the same process. The company intimate that a work which will help architects is their book entitled "Hints About Heating," this being a practical exposition of the problem of heating all kinds of buildings by hot air. It is written by an expert and contains tables and diagrams, and is intended to show the value of Paragon Furnaces as a heating apparatus. The new edition of "Hints About Heating," revised and enlarged, will be sent to any architect on request free of charge.

We understand that to facilitate the adjustment of family and other interests arrangements have been made for a reorganization of the Spicer Stove Company of Providence, R. I., and to this end there was placed on record on January 13 a trust deed transferring the property of the company to John R. Prescott, the present secretary of the Anthony & Cowell Company of that city. It is stated that the retirement of one of the partners and the death of another rendered certain rearrangements necessary, and the appointment of a trustee is a step in this direction. The business, however, will be continued on the same progressive policy which has always been characteristic of the concern. Mr. Prescott, the trustee, under whose management the business will hereafter be conducted, is well known to the trade throughout the country. He was for seven years connected with the Barstow Stove Company of Providence, R. I., and for 16 years was secretary of the Smith & Anthony Company of Boston, Mass. The business of the Anthony & Cowell Company is not affected in any way, Mr. Prescott continuing as secretary as heretofore.

The Toledo Stove Company of Toledo, Ohio, have just closed a contract for the year 1898 to handle in the territory west of Chicago the lines of Stoves and Ranges made by the Chicago Stove & Range Company of Chicago, Ill. We understand that this contract was a *bona fide* sale of the goods, and guarantees the purchase of a stipulated amount during the year on very favorable terms.

A neat little calendar for the new year, which is being distributed by F. Elwood Yeager of 56-58 North Second street, Philadelphia, Pa , is a card measuring about 7 x 10 inches and embellished with a reproduction of a water color design. At the top of the card is the statement that Stove Repairs are a specialty with Mr. Yeager, and that he also handles National Gasoline Stoves, New Era Blue Flame Oil Stoves, Heaters, Ranges, Ovens, &c. The leaves for the different months of the year are attached to the lower part of the card and are printed in a dainty style in keeping with the rest of the calendar.

"From the Mail" is the suggestive title of an exceedingly well printed and neatly bound pamphlet which is being distributed among their friends in the trade by the Schneider & Trenkamp Company of Cleveland, Ohio. The printing is done in two colors, the text appearing in a brown ink, while the illustrations are black. The matter consists for the most part of testimonial letters from some of the many customers of the company, the letters coming from all parts of the United States and showing in an unmistakable manner the satisfaction which the goods have given wherever introduced. The central feature of the pamphlet—which, by the way, is bound in red covers of rich design—is a double page illustration of a kitchen interior equipped with, among other things, the company's Reliable Steel Range and Reliable Gas Stove, the latter being represented in full blast. In offering this publication to the gas fraternity, the company refer to the testimonials as proving the national reputation of the Reliable Gas Ranges. Another interesting feature is the frontispiece, which is made up of excellent likenesses of Paul Schneider and Henry Trenkamp.

The Brotherhood Klondike Stove is the name of a construction which has been brought out by the Edward Miller Cornice & Roofing Company of 940 Railroad street,

Tacoma, Wash., to meet the demand for a Stove peculiarly adapted for use in Alaska. It is stated that those who have been in that country found that the ordinary camp Stove burned out in a few weeks, due no doubt to the fact that it is necessary to severely force it in order to obtain the requisite heat. The Stove made by the company named is a rectangular iron box of No. 18 steel, the fire box being 12 x 14 x 30 inches and having a down draft. It is said to be a powerful heater and will hold a fire for hours. The oven, which is square in shape, is detachable, and when not in use for baking serves as a warming oven or extension of the Stove. The arrangement of parts is such that in setting up the Stove dry sand, gravel or earth is placed in the upper chamber of the Stove and the same in the bottom of the fire box. The oven is hung on the Stove with the sand chamber in contact with it so as to heat the sand. When ready for baking the oven is placed on top of the Stove with the hot sand chamber uppermost. When moving about from one place to another the sand is thrown out, and refilled when a new camp is established. The Stove may be carried in compact space, the size being reduced to the dimensions of the main body, for the oven, legs, stove pipe, tins and baking pans can be placed inside and still leave plenty of room for provisions.

In accordance with a custom which they have followed for a number of years, Rathbone, Sard & Co. of Albany, N. Y., issue an Acorn calendar for 1898. It is of the same general style as those of previous years, except that the outer covers are silvered with printed matter in a deep red, forming a rich contrast. Each slip carries the calendar for two months, and also brief reference to Acorn Cook Stoves and Ranges. The calendar is very neat in its make up, and the one for 1898 will doubtless prove fully as popular as those which have been sent out by this enterprising house in past years.

According to newspaper accounts a number of farmers in Indiana were taken in by a new swindle which is going the rounds. Agents who were selling Stoves passed through that section not many months ago and disposed of Ranges to many farmers for $69 each, to be paid for at any time within ten years at 6 per cent. This was the verbal contract, and the paper which the purchaser signed was supposed to be an agreement to that effect. It turns out, however, that the papers signed were promissory notes for $69, due December 1, 1897.

At a meeting of the Board of Directors of the Keely Stove Company, Columbia, Pa., held on Tuesday, January 12, an annual dividend of 5 per cent. was declared.

The Scranton Stove Works of Scranton, Pa., resumed operations on the 17th inst. after a three weeks' shut down, during which time the usual inventory was taken and such repairs made as were found to be necessary.

The Chattanooga Stove Works of Chattanooga, Tenn., have been meeting with an unusually good demand for their products during the past three months, and the works are now running full time with an increased force of hands.

The Kernan Furnace Company, Utica, N. Y., have been awarded a contract from A. B. Brown, Buffalo, N. Y., who is building 50 houses for the Niagara Park Improvement Company of Buffalo, for 50 Hot Air Furnaces. They are to be installed by Edward Keuer, Jr., 400 Connecticut street, Buffalo.

F. H. Moore of the Howard Furnace Company, Syracuse, N. Y., after a visit to Boston was at their New York office, 231 Water street, this week.

Politics Versus Business.

Vice-President George H. Barbour of the Michigan Stove Company, Detroit, Mich., delivered a very interesting address Wednesday evening, January 12, at a dinner given by the Merchants and Manufacturers' Organization to its members. While the subject so interestingly discussed by Mr. Barbour is somewhat foreign to *The Metal Worker*, there was nevertheless a great deal of general interest that appeals to every one, whether in the stove, metal or other lines of business. The first part of his address was as follows :

No doubt many will differ with me in the discussion of this subject, but I feel that it is one that, at the present time at least, calls for a great deal of careful thought In my opinion, politics is a business as well a study, and if politicians would only consider it in this way when acting in any official capacity and not use their offices for selfish or personal gain to the detriment of the public at large, their power, in my opinion, would be more greatly felt. It has always seemed to me that a political official should treat the trust he represents the same as any good business man does the office he holds in any mercantile or manufacturing institution. To succeed in any business, I care not whether as a manufacturer or as a merchant, especial attention and care must be given to all the details. A good business man would not think of employing a bookkeeper for a general superintendent of any manufacturing institution, neither would he think of employing a mechanical expert to keep the books of the institution. A wise man will select the proper parties to fill the proper positions if success is to follow, but is this the condition that governs political offices? Are those who are best fitted for the positions always selected? Not so, but often to the contrary, not only so far as relates to city government, but State and national legislation as well. Often those unfitted for the positions are selected, and this all comes about through political circles—influences brought to bear that this or that man must have a certain appointment regardless of his qualifications. Desired results will not follow under such conditions. If a good business man were to treat the business in which he is engaged in the same way, it would only be a question of time when his business would be ruined.

I have always advocated, and have no reason to change my opinion now, that if we expect good government, appointments should be made from the standpoint of their ability to fill the positions, and especially should this be true in our city government. We are all interested in the success of our city and desire at all times that everything should be so managed that proper results will follow. The government of a city as well as a State or nation should be conducted entirely on business principles.

You may say in any city there are more or less directly interested parties because they may be large tax payers, or some other reason given, but I think not. The laboring man, the man of moderate means, the millionaire, if you please, are all equally interested in the good government of the city in which they live, and to bring about this condition politics should not be the dominating power ; business methods should largely take the place of politics. How long do you think a good business institution, conducted upon business principles, would last and be able to exist, if they were to allow such methods as govern in the building of some of our State and Government buildings? Do you not believe that if an individual capitalist had built our new Government post office, securing the very best architects at the start, watching the building as it was under way of construction, thousands and thousands of dollars would have been saved over the cost to the Government? And do you think it would have taken 10 or 12 years to build it? I think not, and I believe that our Government would save a great deal of money if, when they had buildings to erect, they would allow competition from the leading architects of this country and then have a committee of experts, to be appointed by the President, pass upon the plans submitted by the different architects, and the selection to be made by this committee. The contracts could then be put up for competition and stipulations made calling for the building to be completed within a certain length of time or a heavy penalty follow. I believe in this way a large amount of money could be saved to this Government over present plans.

Mr. Barbour then went on to speak of the street car mail service in the city of Detroit, and proceeded as follows :

There is one more question that I think has been lost sight of by politicians and citizens—our public servants do not have time enough to themselves. Take the Mayor of our city, if you please, as an example; most of his time is occupied in receiving visitors who are making appeals for this or that office either for themselves or their friends, and his time, from early morn until late at night, is occupied in this way. He has to be agreeable to every one, and then if he does not accomplish gigantic things and a vast amount of business he is blamed, whereas it is really the fault of the people that do not give him time to even think. I believe this is a great mistake, and that consent should be given by the general public for officials to close the doors of their private rooms at least two or three hours a day for the purpose of giving a little attention to business matters which are of the utmost importance.

Mr. Barbour closed his address by referring to the plan adopted by Mayor Josiah Quincy of Boston in forming what was spoken of as the Mayor's "Cabinet," this cabinet, whose function is purely advisory, consisting of representatives from the Associated Board of Trade, the Clearing House Association, the Chamber of Commerce, the Merchants' Association, the New England Shoe and Leather Association and the Real Estate Exchange, thus giving an advisory council composed of men in the closest touch with active affairs, and being unconnected with politics they are in a position to give the Mayor disinterested and wise advice.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Dealings have been on a somewhat larger scale, but chiefly between large consumers and importers direct. Thus far this month about 350 tons have arrived here, but a much greater quantity has passed into consumption, and the local statistical position is stronger, since, besides the inroads made upon spot stocks, there has been more or less change in the ownership of the 2950 tons afloat for this country. Wholesale prices have not moved to the extent that would seem to be warranted by the stronger statistical exhibits that have been made of late, but average somewhat higher and are very firm at the advance. Jobbers' quotations are unchanged, but are quite strong at 4½c. per lb. for small lots of Straits Pig from store. The smaller consumptive demand has been quite active.

Copper.—Home consumers are taking up a very fair quantity of various forms of the metal, but their purchases are small in comparison with export movement, the latter being quite up to the late average and sufficient to hold prices quite firm all along the line. About 3,000,000 lbs. or more of Lake Superior Ingot were sold during the week. Dealers' prices for small lots from store remain at about 12¼c. per lb. for Lake Ingot and 11¼c. for Ansonia Grade Casting Copper.

John Stanton reports the Copper production in the United States and of the foreign reporting mines and United States exports as follows, in gross tons of 2240 pounds :

	Reporting mines.	Outside sources.	Total U. S. product.	Product foreign mines.	U. S. exports.
First half 1895....	70,612	9,100	79,712	42,484	34,215
Second half 1895..	84,885	6,600	91,485	43,674	30,507
Total 1895.....	155,497	15,700	171,197	86,178	64,722
First half 1896....	94,180	7,200	101,380	42,255	58,216
Second half 1896..	95,314	7,200	102,514	43,941	67,287
Total 1896.....	199,494	14,400	203,894	86,196	125,503
First half 1897....	103,651	5,000	108,651	44,263	64,870
January, 1897.....	16,937	700	17,637	6,595	9,651
February.....	16,119	700	16,819	7,241	8,856
March.....	17,583	700	18,283	8,358	11,232
April.	16,554	900	17,454	7,318	10,279
May.....	17,805	1,000	18,805	7,116	12,175
June.....	18,653	1,000	19,653	7,635	12,677
July.....	14,244	1,100	15,344	7,327	13,728
August.....	16,309	1,100	17,409	6,963	10,971
September.....	16,343	1,100	17,443	7,541	10,980
October.....	16,341	1,200	17,541	7,108	8,785
November.....	16,227	1,200	17,427	7,073	9,294
December.....	21,091	1,200	22,291	7,995	10,582
Second half 1897..	100,555	6,900	107,455	44,007	64,340
Total 1897.....	204,206	11,900	216,106	88,270	129,210

Sheet Copper.—Rather more activity is noted in the demand for Cornice Copper and the amount of inquiry indicates a considerable volume of business in the early future. Meanwhile, although the run of orders is not yet of extensive proportions, a few good sized contracts for near by deliveries have been placed. Manufacturers, however, are not anxious to book orders for extended deliveries at the prices now ruling, as they look for better rates as the year progresses and the demand for manufactured Copper expands. Small lots of Sheet Copper from stock are quoted by retailers on the basis of 15c per lb., a figure which, however, is sometimes shaded.

Pig Lead.—Moderate sales only have been reported during the week, and the market remains in a flat condition, with negotiations not only confined to unimportant quantities, but moderate all told. Wholesale prices have weakened off somewhat. The large consumers are seemingly out of the market at present. Jobbing business in Pig Lead was rather better than in the preceding week, but is hardly up to standard. Small lots of American Pig are quoted by retailers at 4⅛c. per lb.

St. Louis advices are as follows : The market for Pig Lead has eased off considerably during the past week. The consumptive demand is not heavy, while on the other hand the offerings are quite liberal.

Spelter.—The market here remains in a rather quiet condition and prices are stationary, but firm in the absence of any pressure of offerings. Retail quotations for good Western brands in small lots are at 4.40c. to 4.50c. per lb.

St. Louis advices report the metal to be in much the same condition as last noted. Producers are offering freely at the lower rates lately ruling and find buyers for their surplus stocks without much difficulty.

Sheet Zinc.—No new features have been developed in connection with this material. Sales are of very ordinary type and prices display no variation. Jobbers quote 600-lb. cask lots at 5⅝c. to 5¾c. per lb. and smaller quantities at 6⅛c. to 6¼c.

Antimony.—There is about the usual distribution and prices are almost stationary at about 7¼c. for Japanese, 7½c. for Hallett's and 8½c. for Cookson's in retail quantities.

Nickel.—Sellers quote 38c. per lb. for small lots.

Aluminum.—The demand for this metal in its various forms is well sustained. No change has been made in prices, which are as follows: No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb.; 100-lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb.; 100-lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb.; 100-lb. lots, 30c.

Tin Plate.—American Coke Plates, which have been selling in fair sized lots for future delivery, are the only ones that have cut any figure in the market in the past week in this locality. Other Plates have moved very slowly, except in a small jobbing way. Prices for large lots are somewhat weak, and recent sales are understood to have been put through at very low figures. More mills are in the market with offers of Plates for both near and future shipment, and some lively competition is said to be going on for the large canners' orders which are pending. Consumers are holding off in a very decided way. They seem to be waiting to see how the cat jumps in the negotiations now going on between the makers looking to a combination of interests. Some of the larger consumers are of the opinion that prices will go lower if the movement fails, but how that can be it is difficult to imagine, for, from all accounts, the prices now current for American Cokes and the cheaper Ternes are already well down to cost. In any event it is pretty well accepted that a large amount of material will certainly be required before long, which, with the orders now in hand, will give plenty of work for the mills for the next few months. As noted elsewhere in this issue, preliminary steps have been taken by the Tin Plate makers for a consolidation on the lines followed in the proposed Wire combination, and thus far there has been some encouragement. The number of plants is large, however, and the capacity for independent action of recalcitrant works under the lee of a consolidation is not easily measured. Jobbers' prices for small lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are quoted about as follows, but these rates are not infrequently shaded: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3 50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20 ,$4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are without change in price, and, outside of purchases by exporting packers, are only selling in a small retail way.

Chicago advices are as follows: Manufacturers report an unusually heavy business. Last year at this time orders for Tin Plates were very light, and factory warehouses were being filled merely to keep the men employed. Now orders have been so freely booked that it is difficult to find factories whose capacity is not covered well into spring, while manufacturers are actually being pressed for deliveries. It is rather remarkable under the circumstances that prices show no increase.

Sheet Iron.—A very fair amount of business is being done, considering the season, in both Black and Galvanized Sheets, and some of the mills are filled up for the next two or three months. The makers, however, are not disposed to sell for delivery beyond the first quarter of the year at the prices now ruling, believing that indications point to higher prices later on. Jobbers report a better demand for Galvanized Sheets from the smaller consumers. Their sales have been larger than of late, but considerable complaint is made of unsatisfactory prices. Small lots from stock are quoted at about 2.35c. to 2.40c. for No. 27 Common Black Sheets, and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: Numerous orders are being placed for both Black and Galvanized Sheets.

Some of the largest buyers, however, are making determined efforts to hammer prices, but manufacturers' agents insist that the mills are presenting a firm front, owing to the scarcity of Steel. Small lots of Black Sheets from stock are higher, being now quoted at 2.30c. to 2.40c. Galvanized, however, is selling at 80 and 2½ per cent. off.

Old Metals.—The market has a better appearance, there being more inquiry and more disposition to buy, but bids are below selling ideas, especially in the line of Scrap Iron, so that the amount of actual business has not been important. An exception is found in Scrap Brass, for which a brisk demand exists for export. Prices show but little change, although Scrap Lead is weaker, in sympathy with the decline in the Pig Lead market. Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here:

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8½c.
Heavy Brass	per lb. 5¾c.
Light Brass	per lb. 4¾c.
Lead	per lb. 3¼c.
Tea Lead	per lb. 3 c.
Zinc	per lb. 2½c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10.50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton	5.25
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	4.50

CHICAGO REPORT.

Scrap.—A fair movement is in progress without material change in values. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	6.75	....
Malleable Cast	5.75	....
Stove Plate (free of burnt)	4.75	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9¼c.
Red Brass	....	8 c.
Yellow Brass	....	6¾c.
Light Brass	....	4½c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—The condition of trade is unchanged. The ruling prices of carload lots of 12 tons minimum are as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	7.00	7.25
Council Bluffs, Iowa	7.00	7.25
Lincoln, Neb	7.15	7.40
Sioux City, Iowa	7.50	7.75
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.65
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.00	7.25
Davenport, Iowa	6.30	6.65
St. Joseph, Mo	7.00	7.25
Leavenworth, Kan.	7.00	7.25
Omaha, Neb	7.00	7.25

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

Some parties formerly connected with the Riverside Mfg. Company, Connellsville, Pa., have commenced the construction of a new plant which will probably be in operation in February. The new concern will manufacture Copper Ingots, Brass Ingots, Pig Lead and Spelter Plate.

THE HARDWARE TRADE.

It is evident that in many sections of the country the year's trade has opened with exceptional promise, the jobbers, especially in the West, reporting an early and more active business than usual. There is also a more hopeful tone in the market generally, as indications point to a large business in Iron and related products. In Builders' Hardware and Mechanics' Tools, which have felt so severely the effects of the business depression during the past few years, there is also a better demand, and increased activity in these lines may be counted upon if the present promise in regard to building operations is realized. In the matter of prices there is little new to report, and the market can only be characterized as steady, with slight indications of weakness in some lines. It is, however, on the whole, unquestionably quite well maintained in view of the usual dull months through which the trade has passed.

Advices from Chicago.—The movement of Shelf Hardware is larger than ever before known in January. Jobbers say that floor room is at a premium for laying out orders, which are not only numerous but of good size. Retail merchants are buying general assortments. New stocks are also a feature of the trade at present. It is somewhat singular that the country trade is not stimulated in Wire products, owing to the expectation of the early consummation of the Wire consolidation, but no speculative buying is apparent. The demand for tinners' stock and metals is not very heavy at present, but this is customary in midwinter, when the roofing trade is naturally quiet. The demand for Heavy Hardware continues very satisfactory. Collections are good.

Advices from St. Louis.—The Hardware jobbing trade report a continuance of the heavy demand noted in our last report. Dealers seem to have waited until the turn of the year, and are now sending in their orders, which call for more liberal quantities than the jobbing trade have been accustomed to receive at this season of the year for some time past. The demand for Shelf goods is particularly heavy, and gives promise of continuing so. The weather has not been sea sonable for the past two or three weeks, so that the demand for cold weather goods shows some falling off, but this is more than made up in the demand for other lines. Collections are very satisfactory.

NOTES ON PRICES.

Wire Nails.—There continues to be a fair demand for Wire Nails, but merchants are not purchasing speculatively to any great extent. The manufacturers are firm in maintaining prices and, for the most part, in refusing to accept orders for delivery later than February 28.

Advices from Chicago.—Large buyers admit that none of the manufacturers are showing any weakness. Prices are not only very firm, but the factories seem well sold up for the next 30 days. Jobbers are continuing to sell at old rates, but it is probably only a question of time when they will be obliged to advance their prices. Jobbers' prices for small lots from stock are $1.60 and $1.55 for carloads.

Advices from St. Louis.—The market continues to maintain the strong position noted in our last issue. Mills are not disposed to sell for future delivery even at advanced prices. The demand is excellent for this season of the year, and both mills and jobbers report a very satisfactory trade. Jobbers are asking $1.65 to $1.70, base, for small lots from store.

Cut Nails.—There is little new to report in the Cut Nail market. The volume of business is fair, and a hopeful tone pervades the market in regard to the demand during the next few months.

Advices from Chicago.—The demand for Cut Nails is sluggish, with small lots maintaining the old price of $1.45.

Advices from St. Louis.—There is no improvement to note in this department. Jobbers are asking $1.40 to $1.45, base, for small lots from store.

Barb Wire.—Manufacturers are refusing to accept orders except for delivery the next month or two. It is generally expected that the volume of trade during the coming season will be exceptionally large, and the manufacturers are refusing to have their books encumbered with orders which might interfere with the carrying out of the plans for the consolidation of Wire interests.

Advices from Chicago.—This trade is in the same condition as reported last week. A heavy demand is being received not only for Barb Wire, but also for Woven Fencing. Large contracts are also being placed for Plain Wire. Jobbers' prices are unchanged at $1.60 for Painted and $1.90 for Galvanized Barb Wire in small lots from stock.

Advices from St. Louis.—A very excellent trade is reported by both manufacturers and jobbers. The demand has set in earlier than usual and gives promise of being exceptionally heavy. Jobbers are asking $1.70 for Painted, with the usual advance for Galvanized.

Smooth Wire.—There is a somewhat increased movement in Smooth Wire. Quotations remain as before.

Wrought Iron Pipe.—At a meeting of the manufacturers of butt and lap welded Wrought Iron Pipe, January 14, a series of new base discounts were adopted, similar to those in force before. The following are the base discounts now in use: Small Black Pipe, 57 per cent; Small Galvanized, 50 per cent.; Large Black, 67 per cent.; Large Galvanized, 55 per cent.

Boiler Tubes.—The Boiler Tube market is referred to as very firm with a heavy demand, prices showing little, if any, change. Sizes 2 and 2¼ inches in diameter are 72½ per cent. off; 2½ to 6 inches in diameter are 75 per cent. discount.

Molded Wiping Cloth.—The price of Porsch's Molded Wiping Cloth, manufactured by John Porsch, 1222 Peach street, Erie, Pa., and which is illustrated and described in another column in this issue, is $1.

HEATING AND PLUMBING NOTES.

The contract for furnishing the Heating and Ventilating Apparatus for the new High School at Tonawanda, N. Y., has been let to Machwirth Bros. of Buffalo.

Lawrence E. Milyea, the plumbing inspector of Salem, Mass., has been tendered a banquet by the journeymen plumbers.

An effort is being made to organize a master plumbers' association at Taunton, Mass.

David Bloomfield has been re-elected plumbing inspector of Meriden, Conn.

Plumbers are well represented in the officers of the Builders' Exchange of New Haven, Conn. Robert Morgan is president and C. Elmer Dibble secretary, and A. H. Buckingham is one of the trustees. The retiring president, S. E. Dibble, a well-known plumber, has been a prominent factor in the success of the exchange.

The Kelly & Jones Company of Pittsburgh, manufacturers of Plumbing, Gas, Steam and Oil Well supplies, with works at Greensburg, Pa., have recently opened offices in the Perry-Payne Building, in charge of W. H. Bosworth.

Henion & Hubbell, 61 to 69 North Jefferson street, Chicago, are distributing with their compliments a very convenient pocket diary or daily memorandum book brought out by the Deming Company, Salem, Ohio, for whose Pumps and Well Supplies they are Western sales agents.

Announcement is made from St. Paul, Minn., January 17, that Joe Michel has bought the business of McDonough & Bowers, James T. McDonough, agent; Theo. Michel, trustee, 747 Wabasha street. The firm who deal in Hardware, Tinware, Stoves, Mechanics' Tools, Cutlery, also are plumbers, tinners and steam fitters, and the business will continue as James T. McDonough, agent; Joe Michel, proprietor.

At the last meeting of the Bayonne, N. J., Board of Health a committee, composed of John Howe, Walter Warden and J. J. Devanney, from the Master Plumbers' Association of that city, appeared before them and requested that some action be taken in reference to unlicensed plumbers from out of town doing work in the city to the disadvantage of plumbers who furnished a bond of $2000 for the protection of the city against bad workmanship.

Robert Drysdale, Westerly, R. I., is making extensive improvements in his plumbing shop and has a fine display of high grade Plumbing Goods.

John Erikson of Providence, R. I., has invented and is putting on the market a Gas Stop Cock designed for use in hotels, whereby turning on the gas without lighting it will give an alarm, the object being to prevent suicide from gas asphyxiation.

The Metal Worker acknowledges the receipt of an invitation from the Master Plumbers' Association of the City of New Haven, Conn., to attend the banquet to be tendered to the members and guests of the Connecticut State Association of Master Plumbers, at Tontine Hotel, New Haven, Conn., February 16, 1898, at the close of the State convention.

A unique folder, bearing in embossed letters the words "Twentieth Century," is received from Morgan & Co., 40 Dearborn street, Chicago, Ill., and presents illustrations and drawings showing the Twentieth Century Steam and Hot Water Boiler in its latest and most improved form.

The Board of Aldermen of Denver, Col., have been presented with a series of resolutions by the Plumbers' and Gas Fitters' Union asking for action to prevent department stores from making bargain specialties of Plumbers' and Gas Fitters' Supplies.

"The Sole Heat Retainer, a device to save one-half your coal bill," is the title of a little pamphlet in red covers issued by W. R. Fay, Galesburg, Ill., in reference to his Pipe Covering for steam, hot water and furnace pipes, which can be readily applied and is said to be highly effective in use. It consists of a preparation made of asbestos paper and mineral wool fiber, designed to be put on the pipe with a chemical paste, and can be applied when the pipes are warm or cold. If put on when they are warm it hardens quickly and is then ready for a canvas protection. When put on cold pipes a longer time is required for the covering to harden. A feature of the pamphlet is the numerous testimonials from those who have used it with good results. A half-tone engraving is presented of the Union Hotel, at Galesburg, Ill., in which the pipes are covered with the material furnished by Mr. Fay.

E. S. Wheeler & Co., New Haven, Conn., and 194 Front street, New York, inform us that they have some goods that will interest the plumber who uses open lavatories of modern construction.

It is expected that Brass Goods of the bib and Fuller work type will be advanced in price at the meeting of the Brass Goods manufacturers soon to be held in Buffalo, N. Y.

Hugo Ehrenburg of Hamburg, Germany, is visiting the United States and is interested in our methods of heating. He is stopping at the West Shore Hotel, New York.

Henry S. Downe, the manager of the London office of the American Radiator Company, Chicago, is enjoying a short visit at home. He will sail for London next week.

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Metal and Miscellaneous Prices.

CHICAGO, JANUARY 20, 1898.

Tin—

Straits pigs.....15⅛@15¾¢

American Tin Plates—

American Base Box Quotations.

Based on 32,000 square inches in a box, which is exactly 2 per cent. more than in the English base box of 14 x 20 Tin Plates. The American base box weighs 110 ℔ and the English base box 108 ℔.

Highest Grade Charcoal—Bright.

Size.	Base.	Contents.	Per box.
10 x 14,	110-℔	...240 sheets	$5.65
"	140-℔	" "	7.25
12 x 12,	110-℔	" "	5.75
"	140-℔	" "	7.50
14 x 20,	110-℔	....120 "	5.65
"	140-℔	" "	7.25
"	160-℔	" "	8.85
"	180-℔	" "	10.45
"	200-℔	" "	13.15

20 x 28 double the price of 14 x 20.

12½x17,	140-℔	....120 sheets	5.35
"	180-℔	" "	6.95

Second Grade Charcoal—Bright.

10 x 14,	110-℔	....240 sheets	5.10
"	140-℔	" "	6.15
12 x 12,	110-℔	" "	5.25
"	140-℔	" "	6.30
14 x 20,	110-℔	....120 "	5.10
"	140-℔	" "	6.15
"	160-℔	" "	7.25

20 x 28 double the price of 14 x 20.

Highest Grade Coke—Bright.

10 x 20,	110-℔	....240 sheets	5.75
12 x 12,	110-℔	" "	4.15
"	140-℔	" "	4.95
14 x 20,	110-℔	....120 "	4.00
"	140-℔	" "	4.85

20 x 28 double the price of 14 x 20.

20x26½,	110-℔	....120 sheets	8.00
20x29½,	110-℔	" "	8.85
20x32½,	110-℔	" "	9.90
"	140-℔	" "	12.35
20x39½,	140-℔	" "	15.00

Old English Method Quotations

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$5.25
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	6 75
	IXX, 14 x 20	8.25
	IXXX, 14 x 20	9.75
	IXXXX, 14 x 20	11.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.50
Allaway Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	4.75
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$3.75
	IC, 10 x 20	5.50
	IC, 17 x 17	7.75
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.00
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	4.50
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔	15¢
95 ℔	20¢
90 ℔	25¢
85 ℔	30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	10.50@ 12.00
Worcester Grade, 12 to 14 lbs. coating	8.00@ 9.00
STP / L Grade, 10 to 12 lbs. coating	7.50@ 8.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00

		Per box of 56 sheets.
IX, 14 x 56	21.00	$12.50
IXX, 14 x 56	24.00	14.00
IX, 14 x 60	23.00	13.50
IXX, 14 x 60	27.00	15.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	2.00¢	2.40¢
17 to 20	2 10¢	2.50¢
21 to 24	2.20¢	2.60¢
25 and 26	2.30¢	2.70¢
27	2.40¢	2.80¢

Russia, Planished, &c.	100 ℔.
Patent Planished, ℔, A	$10.20 } 5%
Patent Planished, ℔, B	9.20 } dis.
Craig's Polished Sheet Steel	8½¢
U.S. Polished Sheet Steel No. 27 A	5.05¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing, (100 ℔ lots). (To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.08
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots.....℔, 40¢
100-℔ lots.....℔, 36¢
No. 2 (guaranteed over 90% pure).
Small lots.....℔, 34¢
100-℔ lots.....℔, 33¢
Nickel Aluminum Casting Metal.
Small lots.....℔, 39¢
100-℔ lots.....℔, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....℔, 35¢
100-℔ lots.....℔ 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....℔, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter.....℔, 55¢
Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 ℔ or more. Less quantities, 5¢ ℔ additional.

Wider than	6-in.	14-in.	24-in.
And including.....	14-in.	16-in.	30-in.
	℔	℔	℔
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.78

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-℔ casks.....5¾¢
300-℔ casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&10%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.35
Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. .. ℔ square,	$4.75	$4.50
Galv..... ℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20.. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....℔ 2 ¢
" " Brown.....℔ 1½¢
" " Purple.....℔ 2½¢
" " Ground in oil, B. Red, ℔ 6½¢
" " Ground in oil, Red...℔ 6½¢
" " Ground in oil, Brown, ℔ 5½¢
" " Ground in oil, Purple, ℔ 6½¢
Linseed Oil, Boiled, in bbls.....42¢
Linseed Oil, Raw, in bbls.....40¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal..... .34¢
Spirits Turpentine, in bbls., ℔ gal..36½¢
Asphaltum, Trinidad Refined, ℔ ton. $45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet.....$1.25
Roofing Pitch, ℔ bbl of 300 ℔.....$3.00

NEW YORK, JANUARY 21.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ ℔, 40¢
100-℔ lots.....₩ ℔, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₩ ℔, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 ℔s or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₩ ℔	₩ ℔.	₩ ℔.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.56	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 ℔s 5¢ ₩ ℔ extra.

Antimony—

Cookson.....₩ ℔, 8¾¢
Hallett's.....₩ ℔, 7½¢
Japanese.....₩ ℔, 7¼¢

Brass—Planished.....net

Roll and Sheet.....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per ℔.
¾-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅜-in. up to ½ in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
3-10-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger	Special
2-in. to 3-in., to No. 19, inclusive.	.38

35% off.

Copper & Bronze Tubing—

3¢ ₩ ℔ more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ ℔ 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₩ ℔ basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₩ ℔, 2 00....	2.30¢
Nos. 17 to 21.....	₩ ℔, 2.10....	2.40¢
Nos. 22 to 24.....	₩ ℔, 2.20....	2.50¢
Nos. 25 and 26...	₩ ℔, 2.30....	2.60¢
No. 27.....	₩ ℔, 2.40....	2.70¢
No. 28.....	₩ ℔, 2.50....	2.80¢
American B. B.....		₩ ℔, 4¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ ℔, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ ℔, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ ℔ 8½¢

Galvanized.

Nos. 10 to 16.....	₩ ℔, 12¢	75&10& 5% off.
Nos. 17 to 21.....	₩ ℔, 13¢	
Nos. 22 to 24.....	₩ ℔, 14¢	
Nos. 25 to 26.....	₩ ℔, 15¢	
No. 27.....	₩ ℔, 16¢	
No. 28.....	₩ ℔, 17¢	
No. 29.....	₩ ℔, 19¢	
No. 30.....	₩ ℔, 21¢	

36 in. 1¢ ₩ ℔ higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₩ ℔.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per ℔.....37¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 ℔..... 6 ¢
Lead, Amn. White, in oil..... 6 ¢
Lead, Red, bbls. and ⅛ bbls..... 6 ¢
Lead, Red, kegs..... 6 ¢
Ochre, American..... 1½¢
Red Venetian, American..... 1¾¢
Linseed Oil:
Raw, ₩ gal.....43@44¢
Boiled.....45@46¢
Spirits Turpentine:
In bbls.....35½@35¾¢
In cases.....43½@43¾¢
Putty:
In barrels and ⅛ bbls..... 1¾@2¢
In tubs..... 1¾@2¢
In tin cans..... 2½@3¢
In bladders..... 2@2½¢

Palm Oil. 1500 ℔ casks.

Fancy Lagos.....₩ ℔ 5 ¢
Clarified.....₩ ℔ 4⅞¢
Accra.....₩ ℔ 4¾¢
Half Jack.....₩ ℔ 4½¢
Cecilia.....₩ 100 ℔ $4.85
Choice Red.....₩ 100 ℔ 4.60
(*Spot Oil*, ⅛c. ₩ ℔ *higher.*)

Petroleum Products—

In Barrels (Barrel Included).
Stove Gasoline..... ₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.
Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....70%
Galvanized Iron Range Boilers above 52 gallon.....70%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....65%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized.....50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.
Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock. ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ ℔.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₩ bbl.	$1.47@$1.48
Rosin, E. & F.....	₩ bbl.	1.52@ 1.60
Rosin, G. & H.....	₩ bbl.	1.65@ 1.70
Rosin, I. & K.....	₩ bbl.	1.80@ 1.90
Rosin, M. & N.....	₩ bbl.	2.10@ 2.45

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars. Quarry Station.
Pennsylvania:

Best Bangor, ₩ sqr.	$3.50@	$4.50
No. 1 Bangor Ribbon.....	3.00@	3.25
Pen Argyle, ₩ sqr.....	3.25@	3.50
Peach Bottom, ₩ sqr.....	4.75@	5.60
No. 1 Chapman, ₩ sqr....	3.00@	4.25
Lehigh Slates, ₩ sqr... ..	3.25@	3.80

Vermont:

Sea Green, ₩ sqr.....	$2.45@	$3.05
Purple, ₩ sqr.....	3.75@	4.00
Variegated Purple.....	2.25@	2.90
Unfading Green, ₩ sqr...	3.50@	4.00
Red, ₩ sqr.....	8.50@	10.50

Solder and Soldering Fluids— Solder—

½&½ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔. ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs about 55 ℔, ₩ ℔.....4¢
5% dis.

Yager's Soldering Salts.
½ ℔ bottles, each.....30¢
Large quantities, ₩ ℔.....40¢

Soldering Coppers—

Per ℔.....15½¢@17½¢ net

Spelter—

Western Spelter..... 4.40@4½¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ ℔.....15½¢
Straits, pigs, ℔ ℔..... 14½¢
Straits, in bars, ₩ ℔.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Cailand or Melyn Grade,	IC,	10 x 14	$4.75
		14 x 20	
" "	IX,	10 x 14	5.75
		14 x 20	
" "	IXX,	14 x 20....	6.75
" "	IXXX,	14 x 20....	7.75
" "	IXXXX,	14 x 20....	8.75
" "	DC,	12½ x 17....	4.25
" "	DX,	12½ x 17....	5.25
Allaway Grade,	IC,	10 x 14	4.25
		14 x 20	
" "	IX,	10 x 14	5.00
		14 x 20	
" "	IXX,	14 x 20...	5.75
" "	IXXX,	14 x 20...	6.50
" "	IXXXX,	14 x 20...	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14	$3.50 @ 3.60
		14 x 20	
" "	IX,	10 x 14	4.35 @ 4.45
		14 x 20	

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 ℔	10¢
95 ℔	15¢
90 ℔	20¢
85 ℔	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 ℔ coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 ℔ coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 ℔ coating.....	8.00 @ 9.25
STP Grade, 10 to 12 ℔ coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ ℔.

Charcoal Plates, Bright—

Melyn and Cal-land Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke, IC, 14 x 20..... $4.25
IX, 14 x 20..... 5.25

Terne Plates—

Worcester Grade, IC, 14 x 20.....		4.25
	20 x 28.....	8.50
Dean Grade, IC, 14 x 20.....		4.00
	20 x 28.....	8.00
Gilbertson's Old Method, IC,	14 x 20..	7.50
	20 x 28..	15.00

Troughs, Eave—See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.
1¼ and less, Plain 57%
1¼ and less, Galv..... 50%
1½ and larger, Plain..... .....67%
1½ and larger, Galv..... 55%
Screw and Socket Joint Casing.....65%
Inserted Joint Casing.....60%
Boiler Tubes, 2¼ inch and smaller.72½%
" 2½ inch and larger 75%

Zinc—

600 ℔ casks ₩ ℔ 5¾¢ | Per ℔.....6¼¢

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Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

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Wheeler, Russel & Son, Utica, N. Y.

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Hill-Whitney Aluminum Co., Boston, Mass.
Reymond & Gottlob, 26 Cortlandt St. N. Y.

Aluminum Ware.
Illinois Pure Aluminum Co., Lemont, Ill.

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Art Metal Relief Co., Covington, Ky.
Frand, Martin J. & Co., Camden, N. J
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.

Ash Cans.
Dover Stamping Co., Boston, Mass.

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Peck Bros. & Co., New Haven, Conn.
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I. X. L. Beer Pump Co., Phila., Pa.

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Wolff, L. Mfg. Co., Chicago, Ill.

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Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

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Kansas City Roofing & Cor. Co., Kansas City, Mo.

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Bliss, E. W. Co., Brooklyn, N. Y.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Northrop, H. S., 40 Cherry St., N. Y.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Cocks, Ball, Basin and Stop.
Landers, Frary & Clark, New Britain, Conn.
Peck, Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Art Metal Relief Co., Covington, Ky.
Berger Bros. Co., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N.Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
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Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Copper, Roofing and Cornice.
Gumney, McFarland & Co., Phila., Pa.

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Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
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Ohl. Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Martin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Cuspidors.
Rochester Stamplug Works, Rochester, N. Y.

Cut Offs, Rain Water.
Cooney, Seiner & Co., Indianapolis, Ind.

Dampers.
Berger Bros. Co., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

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Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

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Lyon, Conklin & Co., Baltimore, Md.
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Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Machinery.
Universal Machine Co., Canton, Ohio.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Elbow Patterns.
Rooney, Thos., Lockport, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co, Windsor, Conn.
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Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Conn.

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Eddy Electric Mfg. Co., Windsor, Conn.

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Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
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Expansion Tanks.
Koven, L. O. & Bro., 18 Spruce St., N. Y.

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Wheeler, Russel & Son, Utica, N. Y.

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Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
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Bibb, B. C. Stove Co., Baltimore, Md.
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Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
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Giblin & Co., Utica, N.Y.
Graff & Co., 208 Water St., N. Y.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
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Hull, M. L., Cleveland, O.

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Keen & Hagerty Mfg. Co., Baltimore, Md.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

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Kent, C. M. Mfg. Co., Baltimore, Md.

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Grates.
Jackson, W. Sons, 246 Front St., N. Y.

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Whelan, Dennis, J., Troy, N. Y.

Hammocks.
Palmer, I. E., Middletown, Ct.

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Howard Thermostat Co., Oswego, N. Y.
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Amer. Boiler Co., Chicago, Ill.
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Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

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Munsell, Eugene & Co., 218 Water St., New York.

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Perkins, J. L. & Co., Chicago, Ill.

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Atlanta Steel & Tin Plate Co., Atlanta, Ind.

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Connors, Wm., Troy, N. Y.
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North Penn Iron Co., Phila., Pa.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

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Bangor Excelsior Slate Co., Bangor, Pa.
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Millar, C. & Son, Utica, N. Y.

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Miner & Peck Mfg. Co., New Haven, Conn.
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Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co. Brooklyn, N. Y.
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Republic Iron Works, Pittsburgh, Pa.
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Republic Iron Works, Pittsburgh, Pa.
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Burden, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
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Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

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Sinks.

Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

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Marks, F. R., Ashland, O.

Slaters' Tools.

Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.

Whelan, Dennis J., Troy, N. Y.

Snow Guards.

Halliday, M., East 9th St., N. Y.

Solder.

Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.

Hull, M. L., Cleveland, O.

Speaking Tubes and Whistles.

Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties Sheet Metal.

Vogel, Wm. & Bros., Brooklyn, N. Y.

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Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove Patterns.

Cincinnati Pattern Works, Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros. Co., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.

Parks & Parks, Troy, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.

Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stoves and Ranges.

Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Champion Steel Range Co., Cleveland, Ohio.
Eclipse Stove Co., Mansfield, O.
Graff & Co., 208 Water St., N. Y.
Magee Furnace Co., Boston, Mass
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Sheppard, Isaac A. & Co., Phila., Pa.
Weir Stove Co., Taunton, Mass.

Stoves and Ranges, Gas.

Clark, Geo. M. & Co., Chicago, Ill.
Griswold Mfg. Co., Erie, Pa.
Luther & Lederhos, 9-13 Desbrosses St., N. Y.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Clark, Geo. M. & Co., Chicago, Ill.
Dangler Stove & Mfg. Co., Cleveland, O.
Luther & Lederhos, 9-13 Desbrosses St., N. Y.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.

Tea Kettles.

Hill-Whitney Aluminum Co., Boston, Mass.
Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

Tinners' Tools, Machines and Supplies.

Berger, L. D., Philadelphia, Pa.
Berger Bros. Co., Phila., Pa
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo, N. Y.
North Penn Iron Co., Phila., Pa.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.

Vogel, Wm. & Bros. Brooklyn, N. Y.

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Ætna-Standard Iron & Steel Co., Bridgeport, O.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Berger, L. D., Philadelphia, Pa.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J
Ellwood Tin Plate Co., Ellwood City, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Phillips Tin Plate Co., Inc., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.

Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.

Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Valves.

Eastwood Wire Mfg. Co., Belleville, N. J.
Goodrich, Judson A. Co., 120 Beekman St., N. Y.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.

Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.

Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.

Marston, I. G. & Co., Boston, Mass.

Water Closets.

Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.
Wolff, L. Mfg. Co., Chicago, Ill.

Water Heaters.

Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.

Miner & Peck Mfg. Co., New Haven, Ct.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

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An all round TINSMITH; would prefer a man who also understood steam, hot water and hot air heating; steady job to a steady man. "Tinsmith," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

A first-class all round TINSMITH and jobbing man for general country work. C. B. Frost & Co., Westboro, Mass. Jan. 22

A NICKEL PLATER; thoroughly competent to take charge of polishing and plating department; must have satisfactory recommendations. Address, stating age and experience, Great Western Stove Company, Leavenworth, Kan. Jan. 22

A first-class GALVANIZED IRON WORKER to take charge of large work; must be strictly sober and have good references. "Iron Worker," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

A practical MECHANIC to take charge of a fully equipped foundry and machine shop as superintendent. State terms and references. Lock Box 494, Poughkeepsie, N. Y. Jan. 22

Good TINNER; steady job to one who is sober and industrious. Address, with references, state experience and wages wanted, Fowler Bros., Lowville, N. Y. Jan. 22

A SALESMAN experienced in the tinware and kitchen furnishing lines, and acquainted with the trade in the New England States. Address, stating age, experience, when and where, references and wages expected "S M. C.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

A good all round TINNER; must understand furnace work; must be sober and steady; steady work the year round. 386 New York street, Aurora, Ill. Jan. 15

An experienced GALVANIZER and RETINNER to take charge of galvanizing and retinning plant, capable of doing this work in all its branches; must be an A1 workman, strictly temperate and well recommended; give past experience and wages desired. Lock Box 2141 Batavia, N. Y. Jan. 15

A man with good experience and acquaintance among architects and builders to solicit orders for cornice and roofing work. "L. D.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

An up to date stove, furnace and range SALESMAN for New York City, Brooklyn, New Jersey and vicinity; one who has a trade that he can control; give full particulars. "H H. H.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

Practical stove mounter as FOREMAN of mounting department in stove, range and furnace foundry; one who has had large experience and capable of filling all requirements pertaining to that department; one who has had some experience in that position and capable of handling men preferred; give full particulars. "A. B. C.," office of *The Metal Worker*, 117 and 119 South Fourth street, Philadelphia, Pa. Jan. 15

A first-class jobbing ROOFER; one who understands range and furnace work preferred; steady job; wages $3; nine hours; non-union shop in Brooklyn J. H. Whitley, 193 Fulton street, Brooklyn, N. Y. Jan. 15

Agents to sell on commission nickel plated copper specialties for household use in Delaware, Maryland, West Virginia, Kentucky, Tennessee, Wisconsin and Northern Michigan, also Canada. "N. C," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 15

Non-union STOVE PLATE MOLDERS, by the Atlanta Stove Works, Atlanta, Ga; apply at once; good wages and steady employment. Jan. 15

SALESMAN to sell a first-class line ranges and furnaces to building trade; must have the acquaintance of architects, and experience in building trade in New York City and vicinity; references. Address with particulars, "Ranges and Furnaces," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 8

SITUATIONS WANTED.

By a good helper in a plumbing shop; city or country. Jacob Lous, care of Mr. Adler, 635 East Fifth street, New York City. Jan. 22

As resident or traveling SALESMAN with furnace and stove house; can furnish best of references as to character, ability, &c. "F. L. C.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

As ESTIMATOR, SUPERINTENDENT, FOREMAN or CUTTER with cornice and skylight firm. "E.," 317 Mississippi avenue, Joliet, Ill. Jan. 22

By a CORNICE CUTTER; one who is capable of taking charge of shop; ten years' experience. "T. M.," office of *The Metal Worker*, 232-238 William street, New York City. Jan 22

By an experienced TINNER on inside and outside work; can clerk in store; young man; honest, sober and not afraid to work; references. "Z.," General Delivery, Ft. Wayne, Ind. Jan. 22

By a TINNER who can do tin and slate work; temperate; married. P. O. Box 792, Barnesville, Ohio. Jan. 22

By a first-class PLUMBER; city or country. Thos. McCarthy, 99 Nostrand avenue, Brooklyn, N. Y. Jan. 22

By a PLUMBER, GAS FITTER, ROOFER; understands tinsmithing; new work and general jobbing; reference and license; city or country. A. Yach, 718 Second avenue, New York City. Jan. 22

A young man with over 12 years' experience in the stove and tin business desires a permanent position; can give exceptional references; with one firm 12 years; practical tinner; capable of taking charge of store; can give bonds. "Stove Store," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

By a TIN and SHEET IRON WORKER, as cutter and general workman. "L. A.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

By a CORNICE CUTTER and TINSMITH as general workman. "E. B.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

Steady position with reliable firm by a first-class SPINNER; a good all around mechanic on round and oval work; any kind of metal; 22 years' experience; sober and steady. H. Meisterknecht, 446 East Seventy-sixth street, New York City. Jan. 22

As FOREMAN in a cornice or sheet metal shop, by a practical draftsman and an accurate estimator; good references as to character and ability. A. C. Acton, 522 North Second street, Camden, N. J. Jan. 22

As PLUMBER'S HELPER. Joseph Levitt, 246 East Fourth street, New York City. Jan. 22

By a TINSMITH; a first-class mechanic, with the best of references from last employers; a steady position. Frank Brand, 156 East 103d street, New York City. Jan. 22

By a first-class CORNICE and SKYLIGHT MAKER and CUTTER; able to work at the bench as well as at the drawing table; wages very reasonable; best of refereuces. "Cornice and Skylight," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

As SUPERINTENDENT or FOREMAN, by man of experienco in the manufacture of sheet metal goods; competent in the management of men and machinery and a hustler; some experience as traveling salesman and sales manager; best references furnished. "Hustler," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 22

By a first-class CORNICEMAN; inside or outside work; a hustler; will be willing to work for moderate wages; New England States preferred. "B.," 200 Marion street, East Boston, Mass. Jan. 22

By a practical steam fitter, hot water heating and ventilatiug engineer, as SUPERINTENDENT or FOREMAN; thoroughly versed in estimating, soliciting and superintending high and low pressure work, ventilating fan work; best of references. "F. A. H.," 16 North Seventh street, La Fayette, Ind. Jan. 22

Young man who is thoroughly versed in geometry and mensuration wishes position as CUTTER in cornice shop anywhere in Illinois "Geometry," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 22

As FOREMAN or STOVE MOUNTER, by a first-class man over 20 years' experience. Henry Guyer, 375 Central avenue, Albany, N. Y. Jan. 22

Side line by a SALESMAN with an established trade in New York and New England States; visits harness and carriage repositories, hardware and department stores. J. L. Cato, 326 Troupe street, Rochester, N. Y. Jan. 22

By young man of ten years' experience in tinning, plumbing, roofing and furnace work; an all around hustler; not afraid of work, and can sell hardware, keep books, &c.; age 25; married; strictly sober; can furnish best references; permanent position wanted. Box 25, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 22

By a TINSMITH, ROOFER and SHEET IRON WORKER. Lewis Kronovitz, 268 East Fourth street, New York City. Jan. 22

By a TINSMITH, ROOFER and SHEET IRON WORKER. B. Wolf, 38 Lewis street, New York City. Jan. 22

By a man 36 years of age who has had 20 years' experience at die and tool making; understands all kinds of stamping work, stove trimmings, steel ranges, &c.; best of references. "J. J. M.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

By a young man, single, who has had 12 years' experience as tinsmith; understands all branches of the trade, furnace and country work; country town preferred. Wm. J. Smith, Johnston, R. I. Jan. 22

As FOREMAN or CUTTER in cornice and skylight shop, by a first-class draftsman and cutter; thoroughly understands the business in all its branches; cutting, estimating, &c.; can give the best of references. "Cutter," 504 West Fifty-seventh street, New York City. Jan. 22

By a practical TIN and SHEET IRON WORKER; proficient in all branches of the trade, with large experience; understands city and country work of all kinds; would prefer an inside job at moderate wages; is temperate and reliable; can furnish A1 references. F. Lockwood, 15 Dominick street, New York. Jan. 22

By a first-class PLUMBER and GAS, STEAM and HOT WATER FITTER, well posted in planning and estimating; South or West preferred. T. King, Grand Rapids, Mich. Jan. 22

A managing SUPERINTENDENT and BUYER, thoroughly competent to take entire charge of a plumbing supply house, is open for a new connection with a house doing a large business in the vicinity of New York; is yet a young man, but has had a long experience; will exchange references; has had a responsible position, and wishes to assume one. "Materials," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

STOVE SALESMAN of experience, energy and ability wishes to reprcseut manufacturer of an up to date line of cast ranges and heaters, includng "Round Oaks" and "air tights," in New York State on commission; "Trade-mark" line preferred. Please address at once "Stove Salesman," 192 Hoyt strect, Buffalo, N. Y. Jan. 22

By a young married man, a practical BUYER or SALESMAN, acquainted with all the discounts of the hardware business; a practical A1 double or single entry bookkeeper; seven years' experience; the very best of references. Chas. F. Connor, Salamanca, N. Y., care Empire Store. Jan. 22

By competent HEATING ENGINEER, as outside superintendent, steam, water and fan blast work; good draftsman, accurate estimator, able to handle help, correct defective plans and take charge of large or small jobs; good references. "Steam and Water," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

By a young man 19 years of age, as TINSMITH in some country shop; has had about four years' experience at tinning, pump and stove work; has also worked at plumbing; can furnish references; reasonable wages expected. Roscoe Batey, P. O. Box 99, Patchogue, L. I. Jan. 15

By a young man who has had nine years' experience at all kinds of tin and sheet iron work; can do a fair job of plumbing, run a store if necessary; references as to character and ability; married. "Plumber," care Empire Store, Salamanca, N. Y. Jan. 15

A BOOKKEEPER or SALESMAN in store handling stoves, ranges, furnaces, &c.; can figure estimates and oversee work; five years' experience. "C.," office of *The Metal Worker*, 70 Kilby street, Boston, Mass. Jan. 15

As SALESMAN for a tin plate mill in Chicago and the West, making bright, coke and terne plates; long experience, best references. "Tin Plates," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 15

An experienced energetic HARDWARE SALESMAN wishes to represent a live manufacturer of wire nails and barbed wire in New York State on commission for 1898; highest references furnished. "C. R.," 192 Hoyt street, Buffalo, N. Y. Jan. 15

By a PLUMBER 22 years of age; can do roofing and spoutiug; can furnish refereuces from last employer; steady job desired. P. E. Burke, 30 New street, Orange, N. J. Jan. 15

By a TINSMITH and ROOFER. Jacob Westenberg, 436 Summit avenue, Hobokeu, N. J. Jan. 15

Special Notices.

FOR SALE.

Stove, Tin and Plumbing business in town 15 miles from Boston. Population 4000. Business established 30 years. Address or call and see for yourself,

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Splendid Opportunity.

If you wish to buy half interest or the entire plant of a small well established foundry with a good market, do not fail to get particulars at once, as this is a bargain for the right party. Good reasons for selling. Address

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of several years' experience wants to furnish Cornice Brake and go in with some live tinner who is already established.

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FOR SALE.

To close an estate, a stock of Hardware with established business of over 40 years' standing in the live manufacturing town of Bennington, Vt. Stock inventories nearly $6000 and will sell it cash at great reduction if sold at once, Possession given immediately. Apply either to

C. P. SHERWOOD, White Plains, N. Y., or
A. P. CHILDS, Bennington, Vt.

WANTED.

36 in. Hand or Power Squaring Shears and 8 ft. Cornice Brake in good order. Address, with price,

J. T. WHITEHEAD & CO., Detroit, Mich.

For One Dollar ($1.00)

I will send postpaid complete, full size Patterns for Two, Three and Four pieced Elbows, from Two inch to Twenty inch, inclusive, 57 patterns in all.

These Patterns are developed on heavy detail paper, and will save their cost many times over.

No "jump rule" or "guess work," but the true cut, accurately laid out and serviceable for shop use

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A Rare Chance

for a practical plumber to form a partnership with a tinner. Water works now being installed in the town. Only shop in the place. Have several large plumbing jobs in view, also contract for tapping the main. Machines and tools complete for both plumbing and tinning. Established several years. Would sell whole or half interest; have business in another place. For full particulars address

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Valuable Patent For Sale.

The attention of manufacturers of Sheet Iron Stoves is called to a recently patented waste heat Radiator and Circulator, guaranteed to give more heat and a more uniform distribution of the same than any other existing heater, while its cost is less. For information and terms address

CHARLES HEMJE, Annapolis, Md.

FOR SALE CHEAP.

A complete plant for manufacturing Gasoline Stoves. List of tools and machines on application.

Address "A.,"

office of *The Metal Worker*, 59 Dearborn St., Chicago, Ill.

Executors' Sale.

Will be sold at public sale No. 121 West Market Street, Westchester, Pa., on Tuesday, Jan. 25, 1898, the valuable store property belonging to the Est. of George Fitzsimmons, Dec'd, where a profitable Tin, Stove and Plumbing business has been conducted for over forty years. Consisting of a large three Story Brick building, 25 feet front; two story frame work shop attached with large Brick Stable on rear of lot. $3,000 can remain in the property at 5 per cent. This property is being sold to close the Est.

HOWARD FITZSIMMONS, }
JESSE L. JONES, } Executors.

THOS. LOCK, Attorney.

Special Notices.

FOR SALE.

Hardware, Stove and Tin Store doing paying business in a live northern Ohio town. Our books open for investigation. Good opening to step into an established business. Stock $8000 to $9000, but will reduce to suit purchaser.

No Real Estate wanted. Reason for selling, have other business. Address

A. F. MILLER & CO.
Geneva, Ohio.

FOR SALE.

1 Set Tinners' Tools in good condition.
1 Noyes Sheet Metal Groover with Roof Seamer attachment.
1 No. 5 Buffalo Portable Forge, nearly new.
1 No. 188 Parker's combination Pipe Vise, 4 in. jaw, nearly new. Above will be sold cheap if taken soon. Address

A. F. MILLER & CO., Geneva, Ohio.

I WANT TO BUY

small Tin shop or will have half interest in one; state location and price. City or country. Address

"BOX 22,"
East Norwich, L. I., Queens Co.

FOR SALE.

Hardware, Stove and Tinware Store, Tin Shop attached, doing good business, established twenty-five years. Central location in county seat. Will give satisfactory reason for wanting to sell. Will reduce stock to $2000. Address P. O. Box 204,

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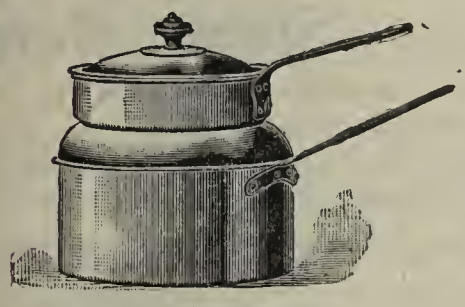
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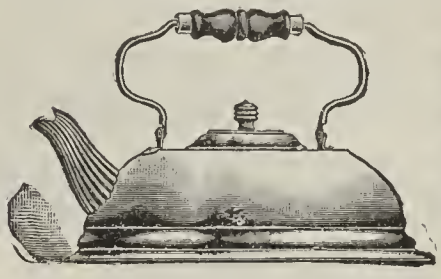


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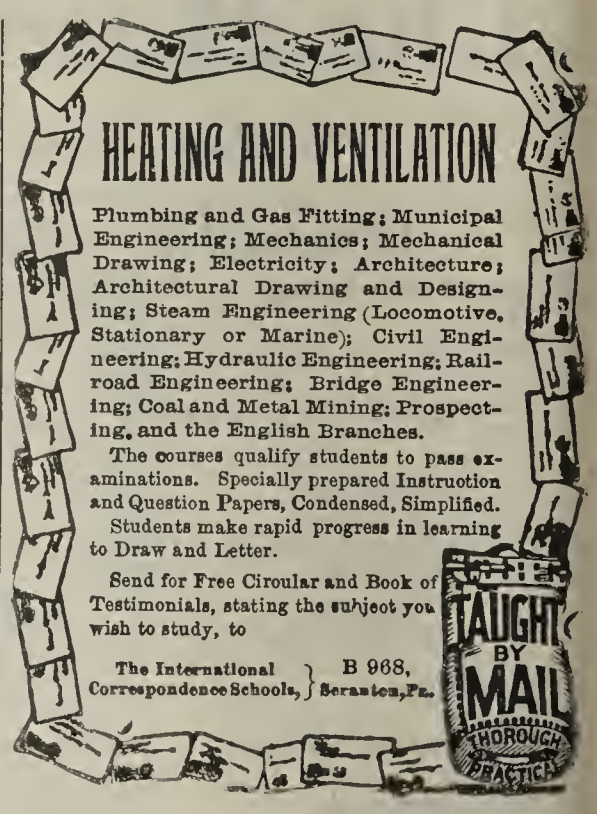
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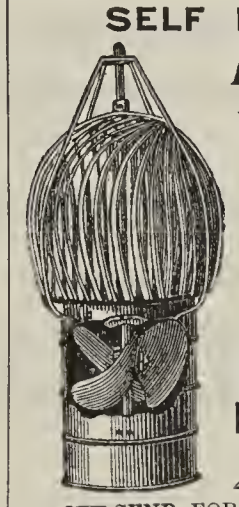
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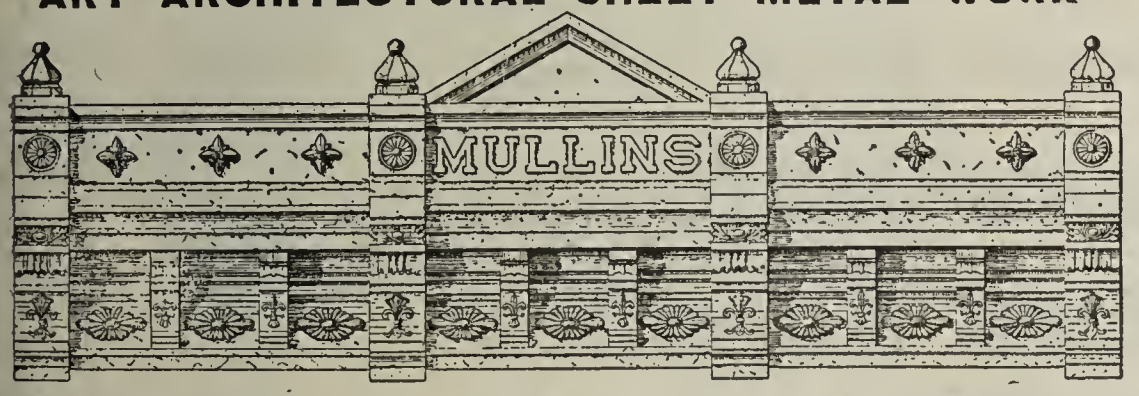
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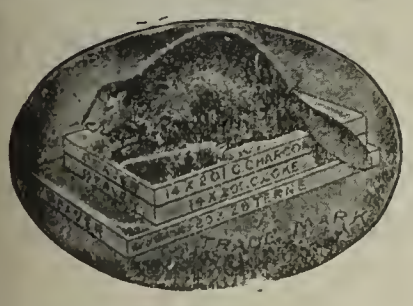
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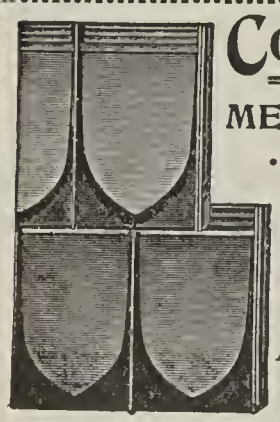


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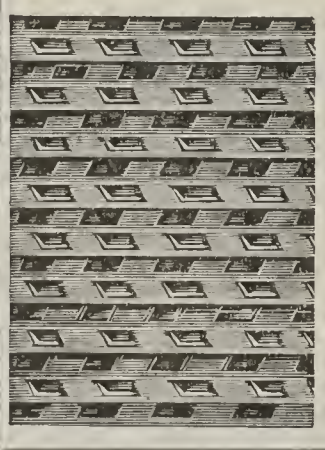
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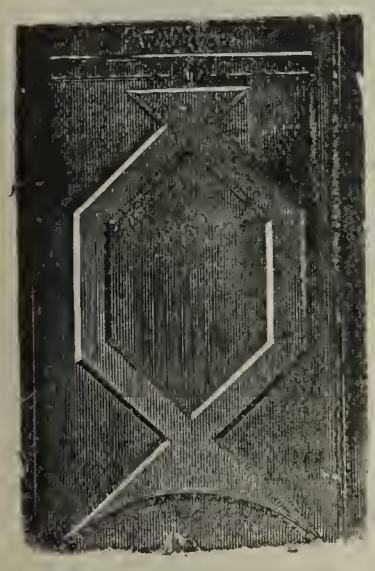
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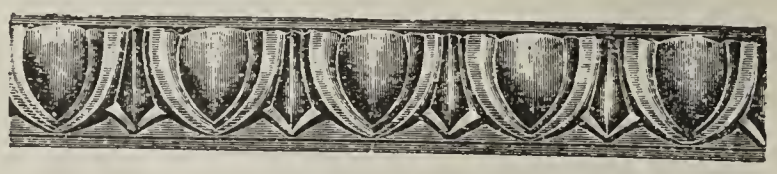
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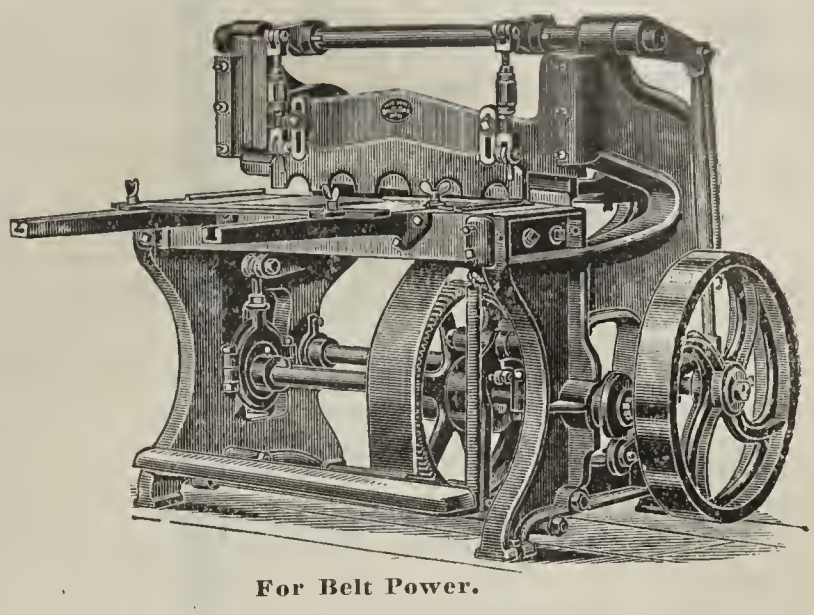


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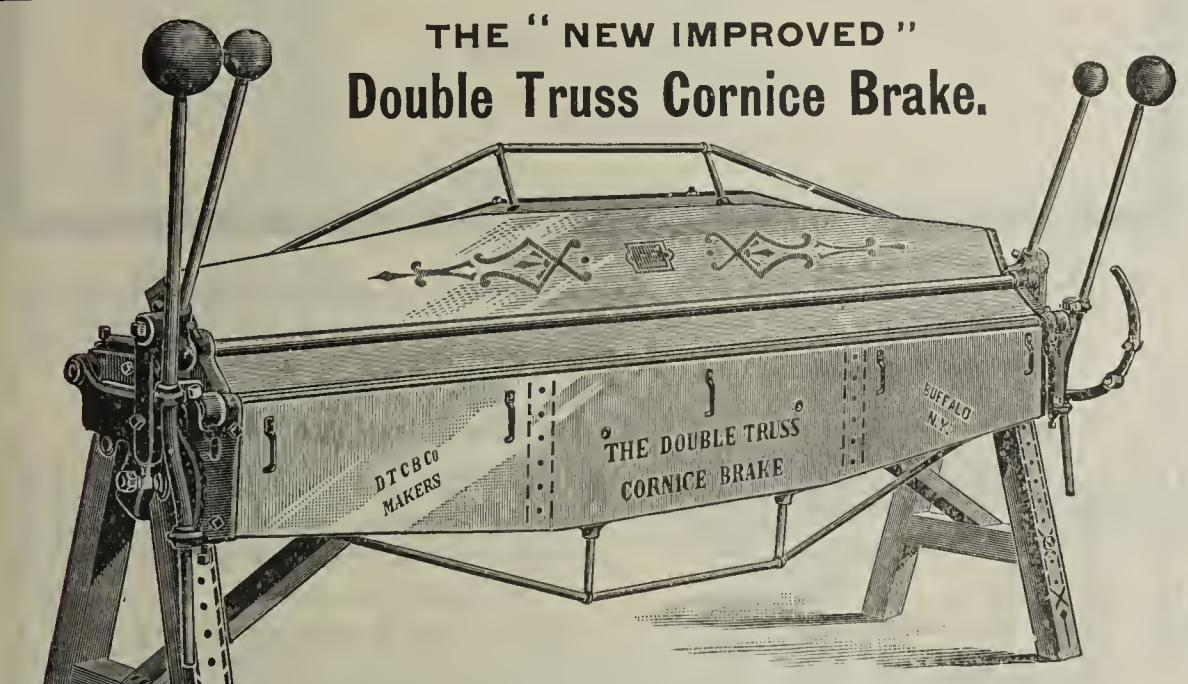
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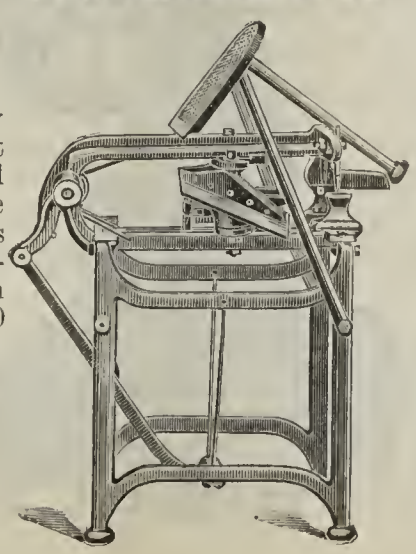
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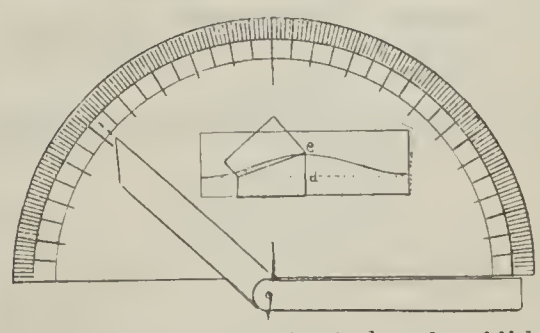
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I. Terms and Definitions—15 pages.
II. Drawing Instruments and Materials —13 pages.
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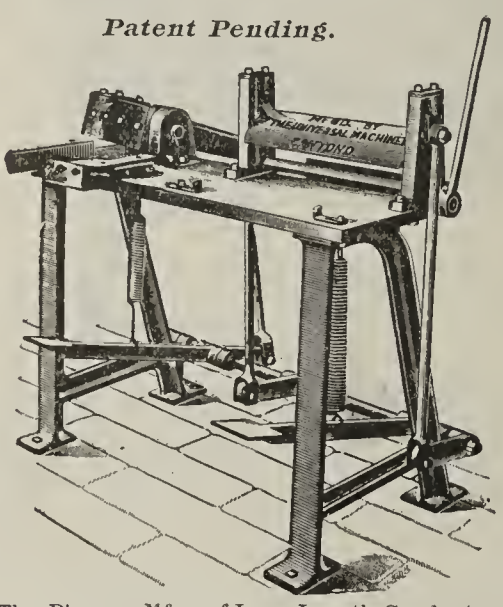
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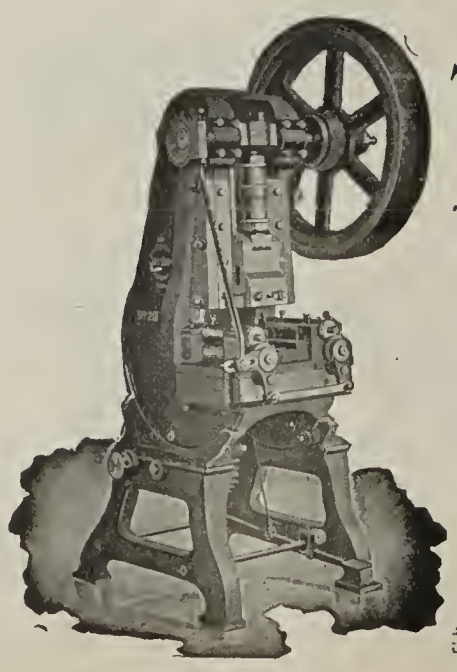
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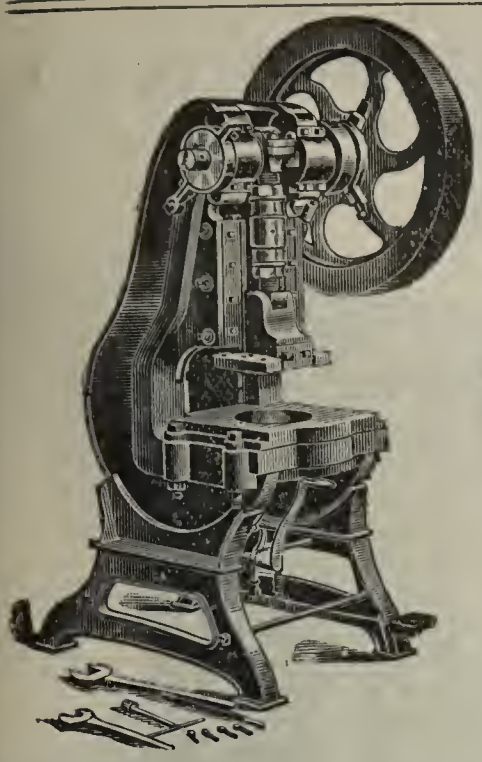
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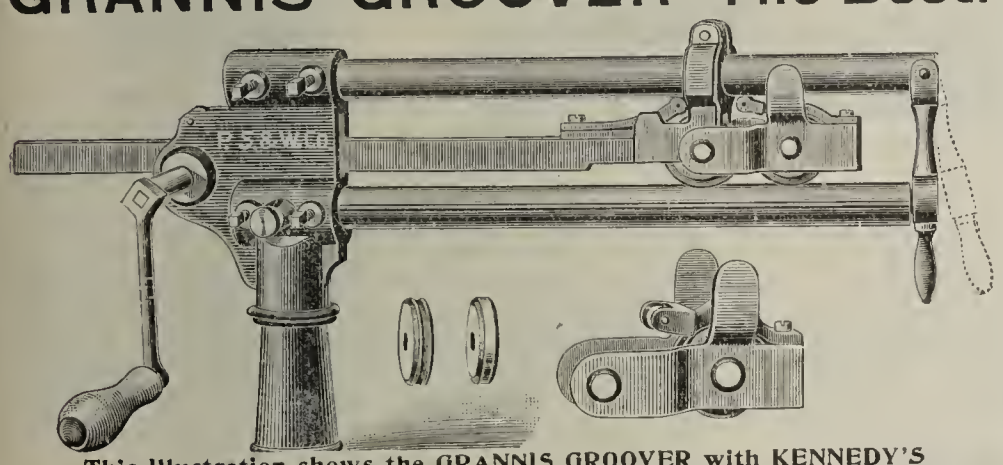
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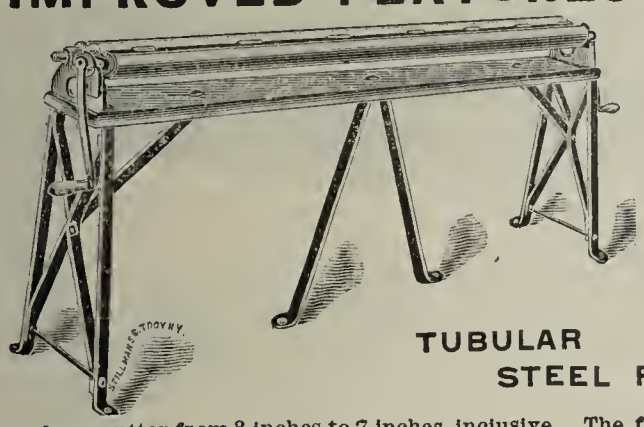
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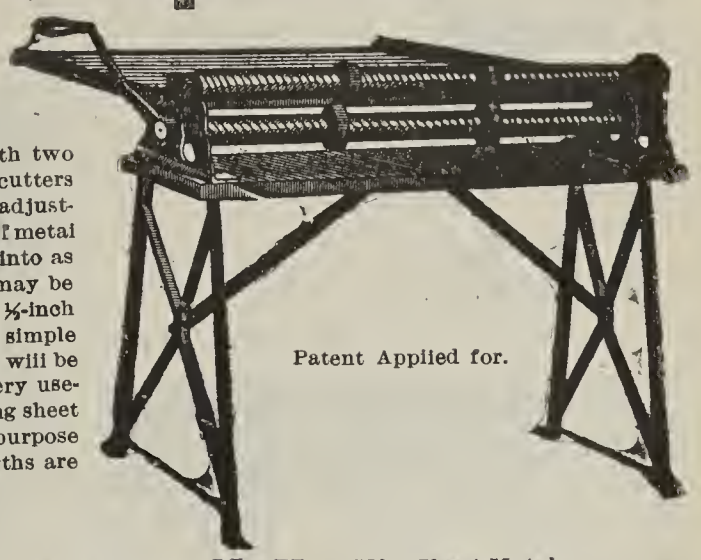
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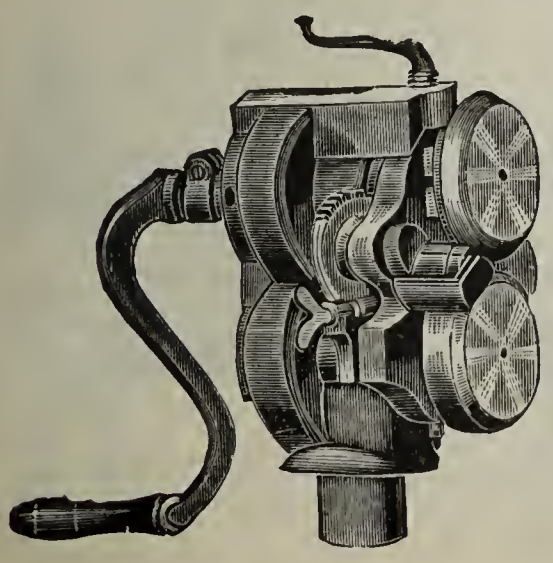


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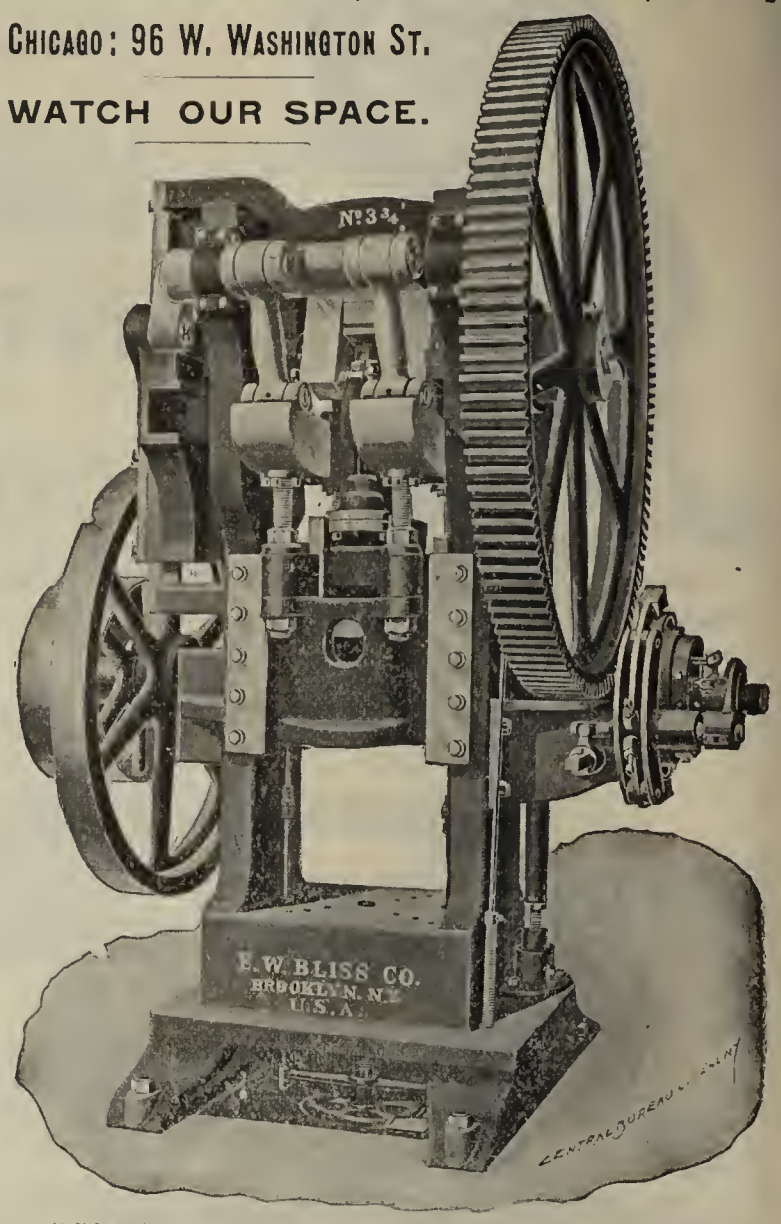
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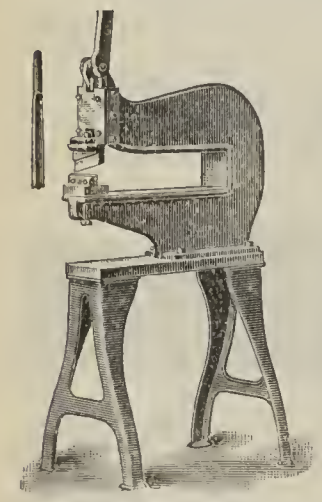
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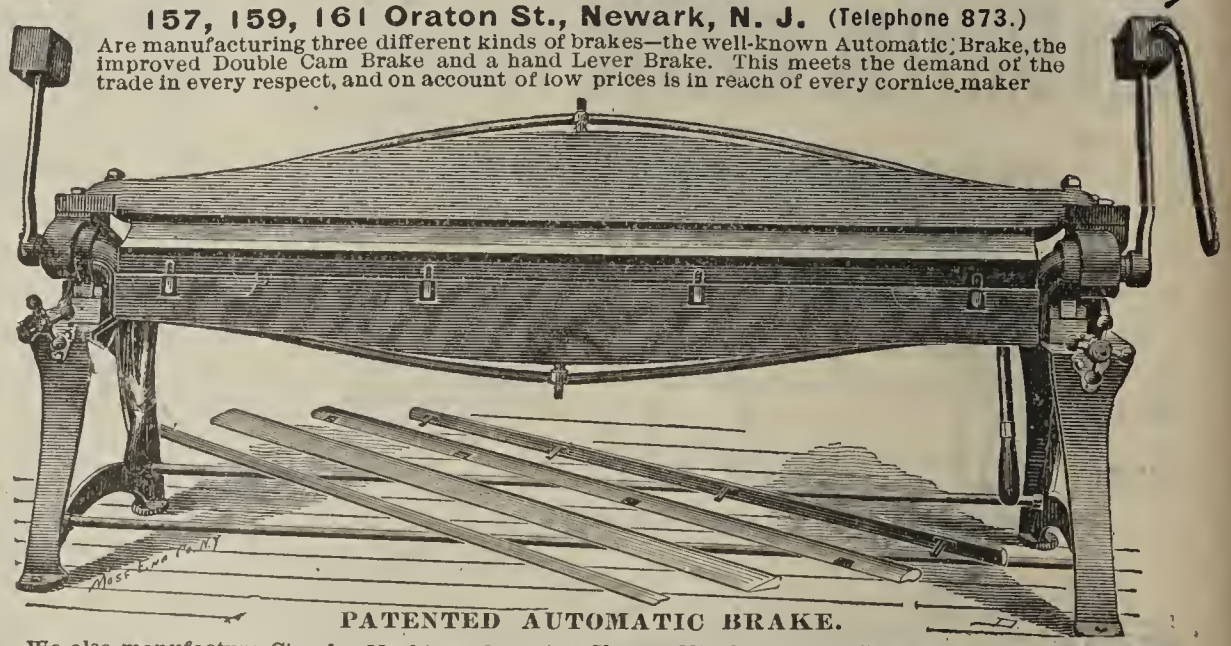
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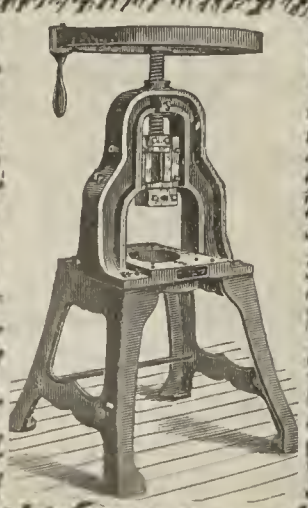
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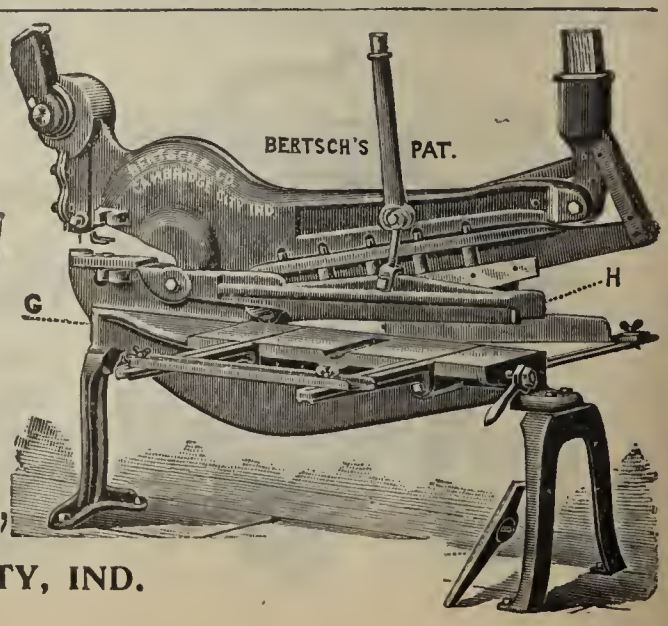
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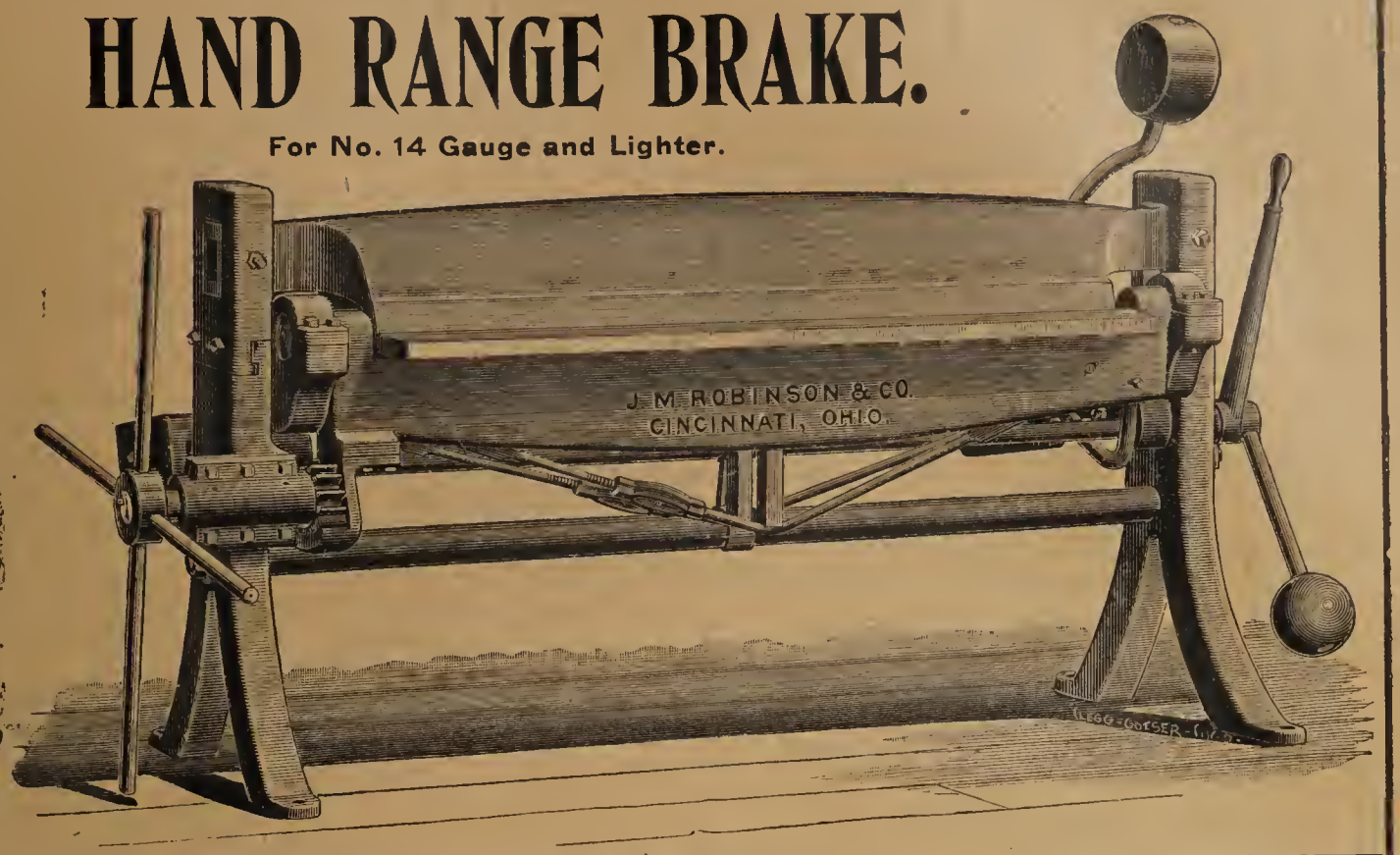
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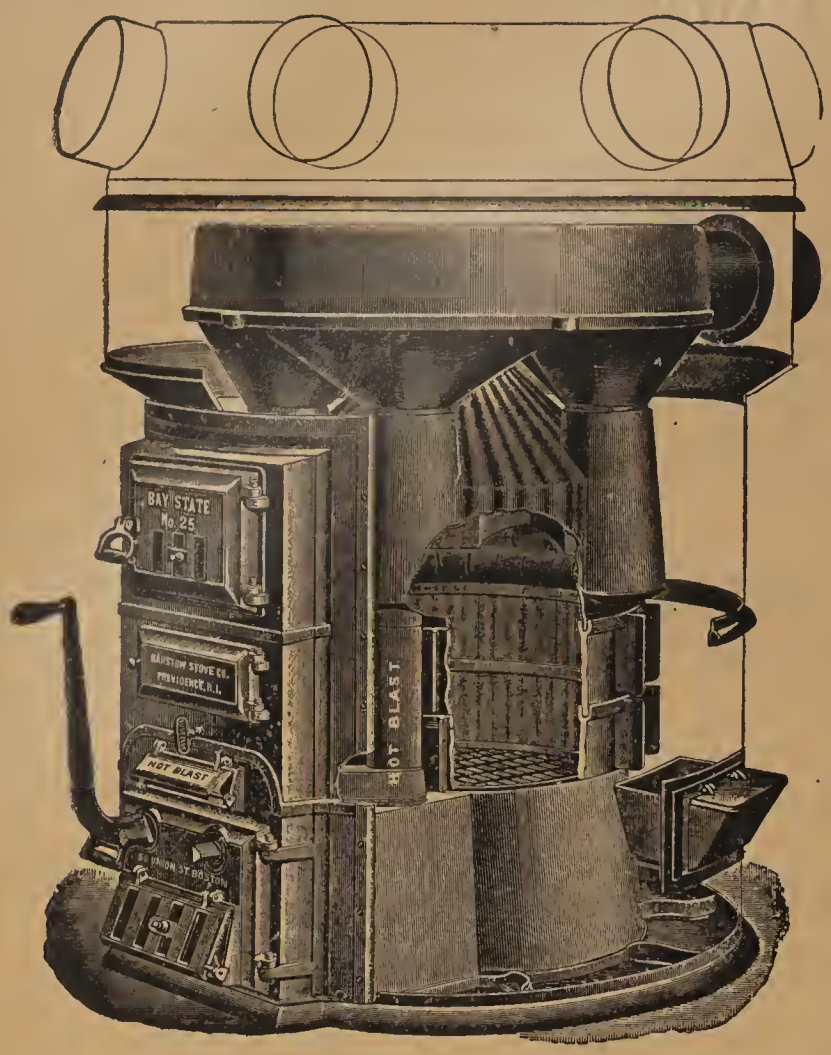
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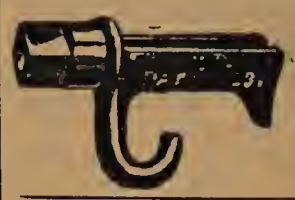
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A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

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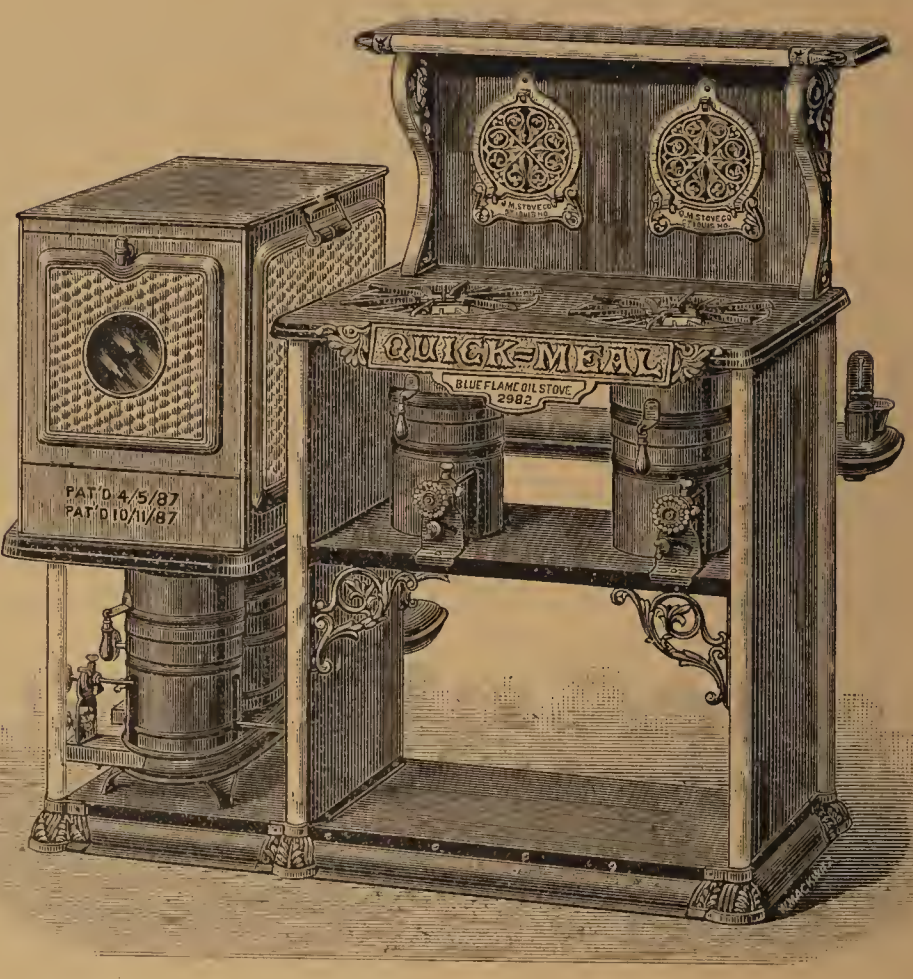
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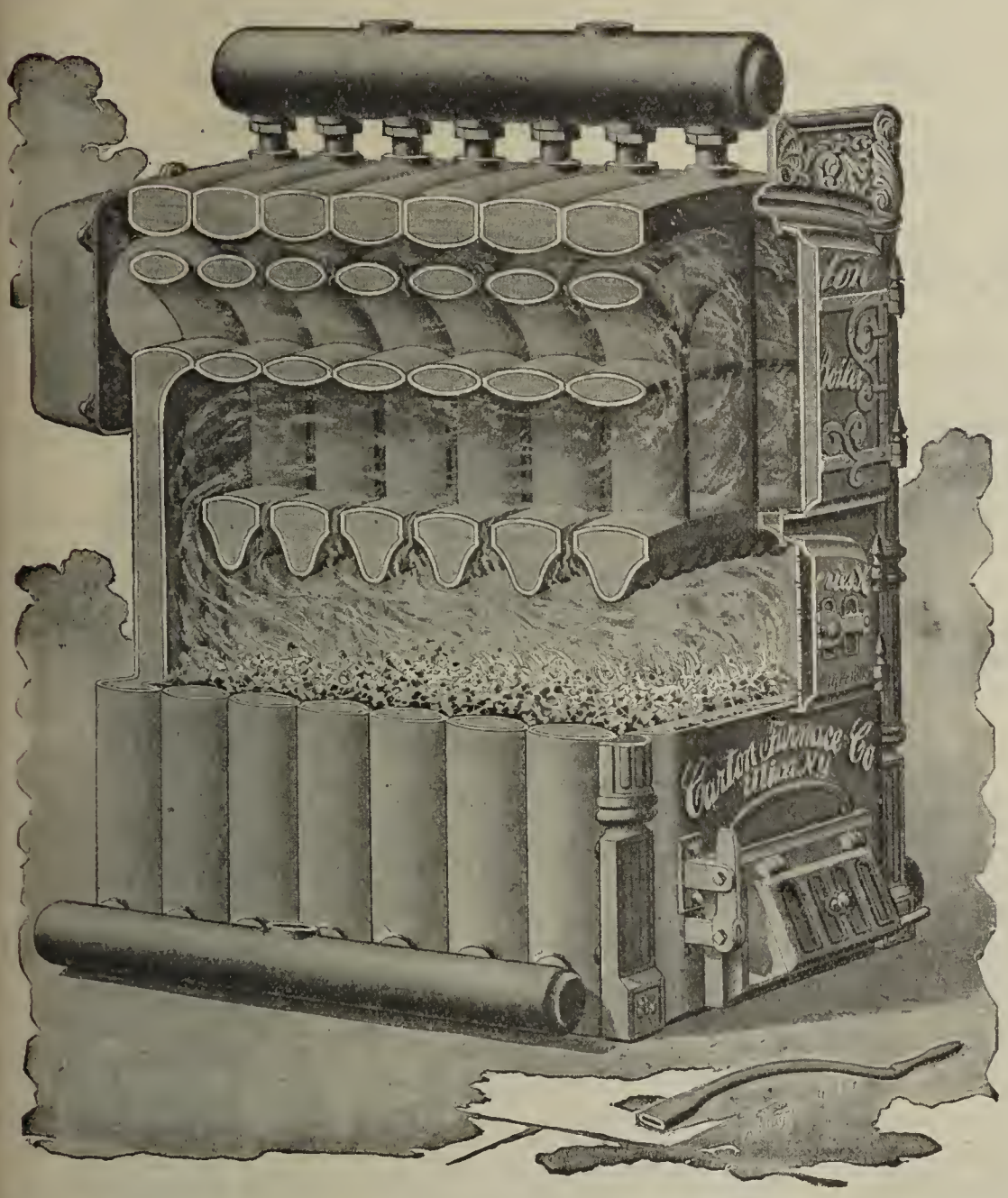
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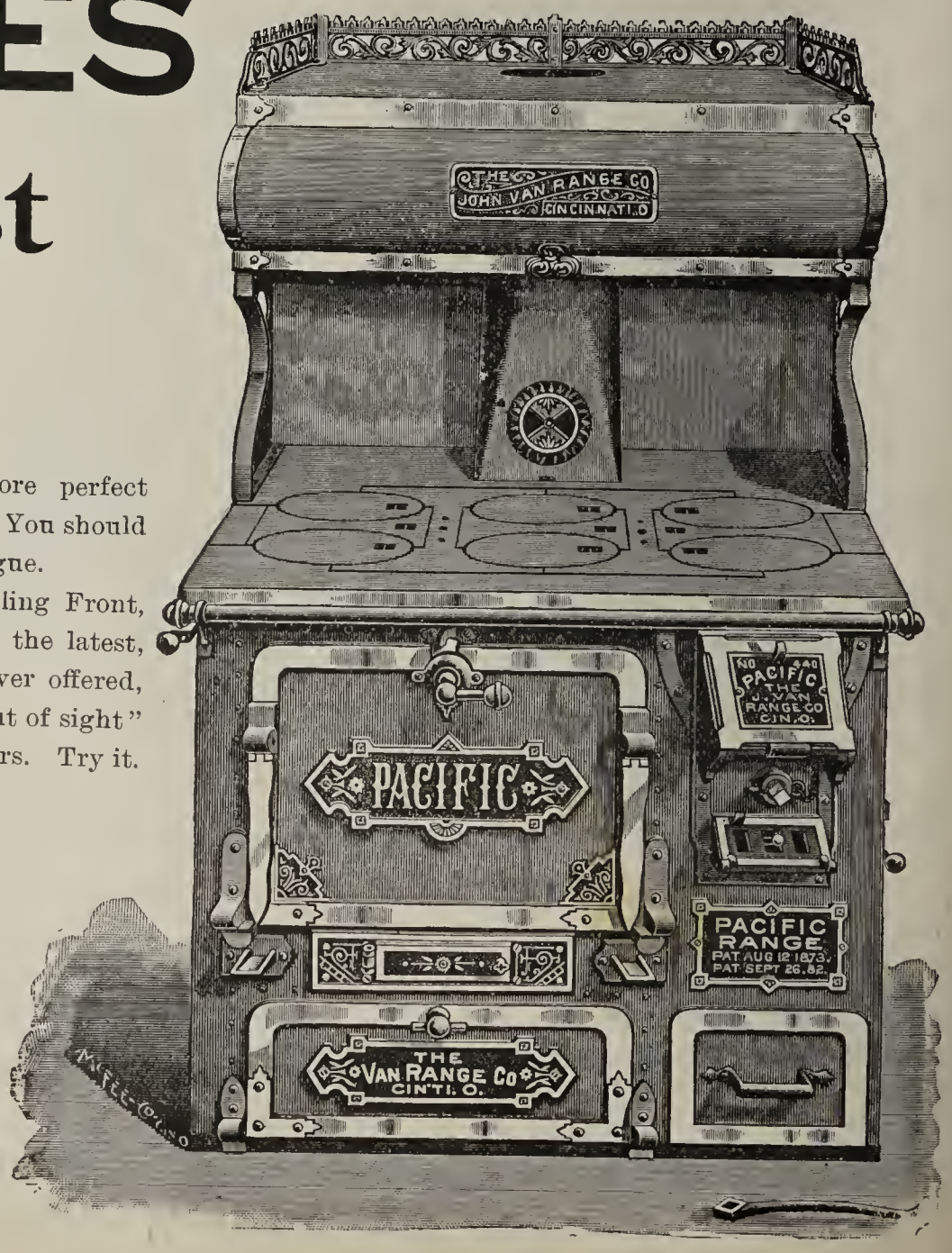
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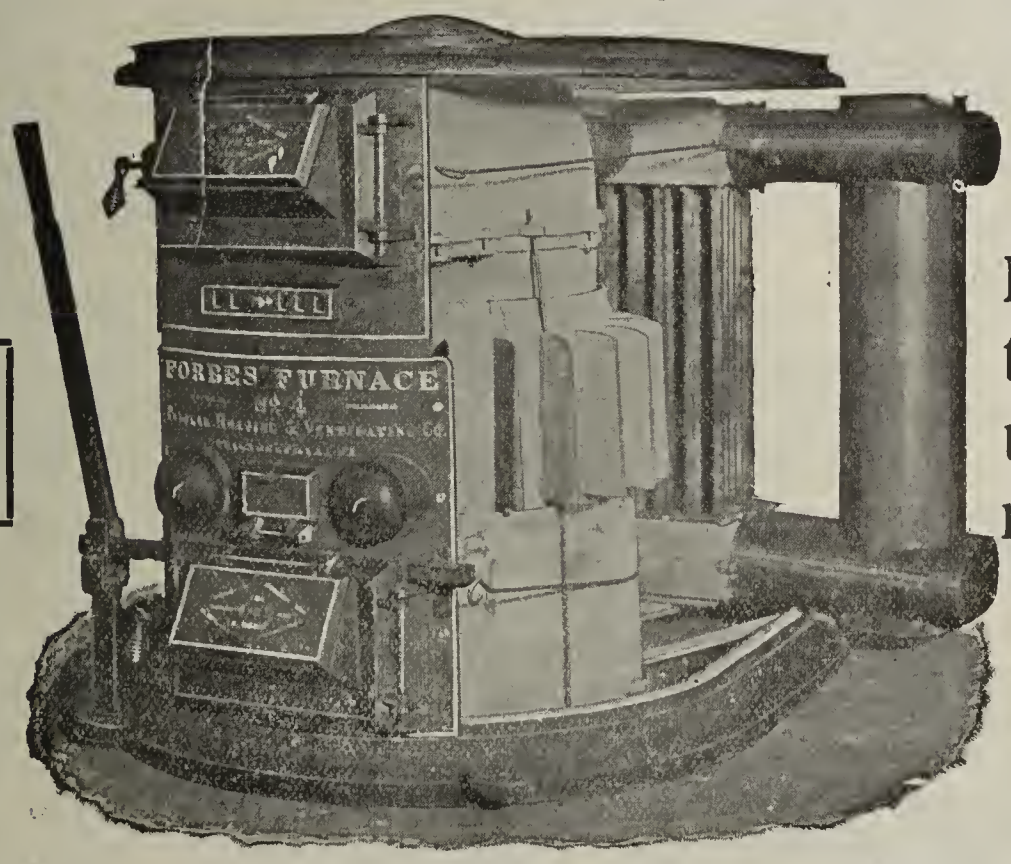
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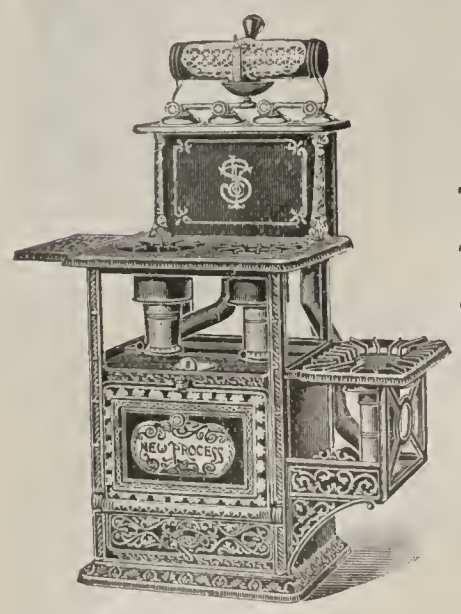
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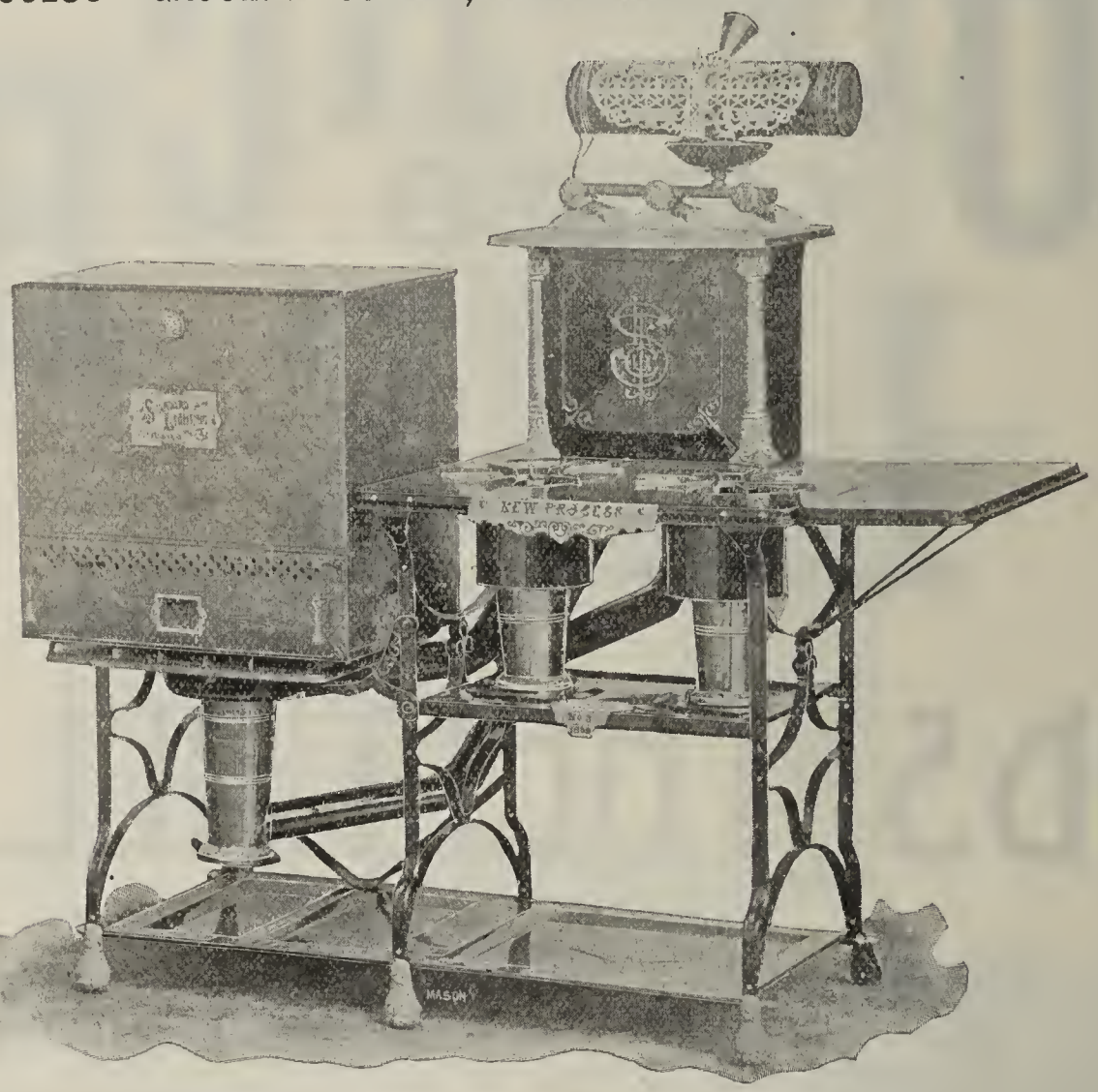
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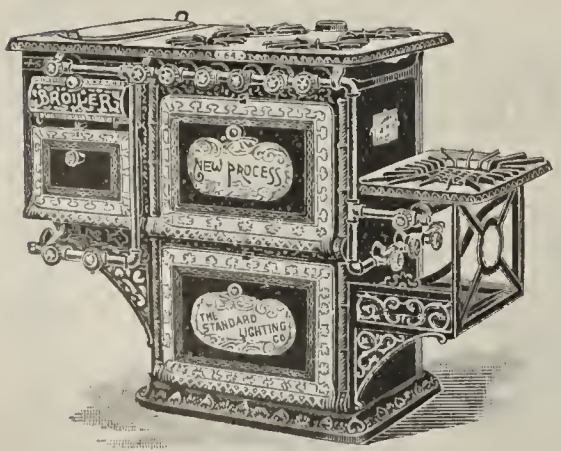
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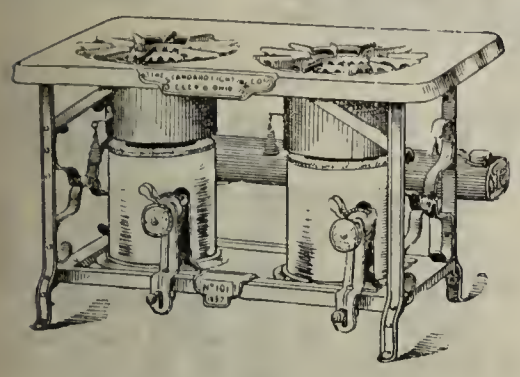
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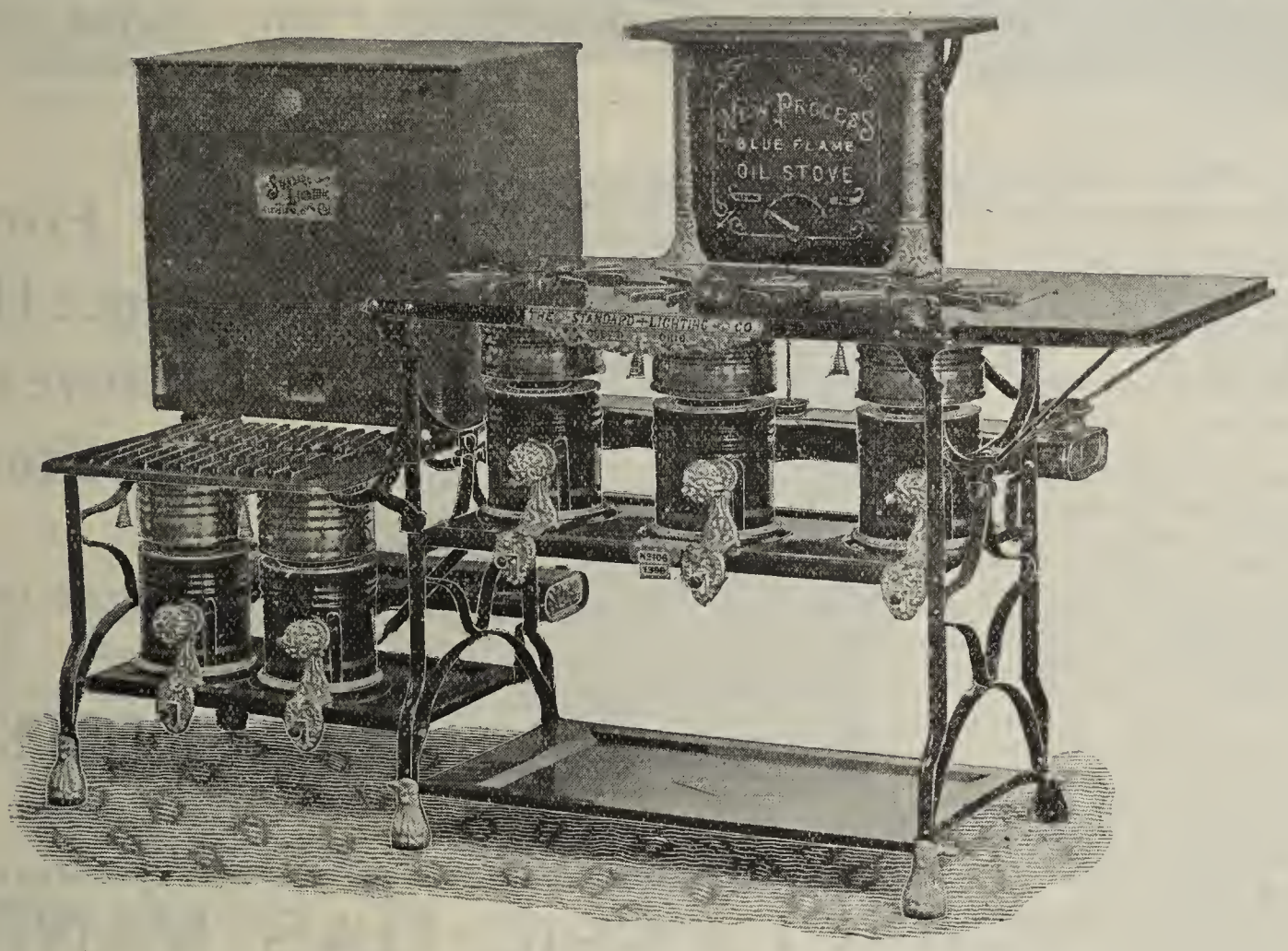
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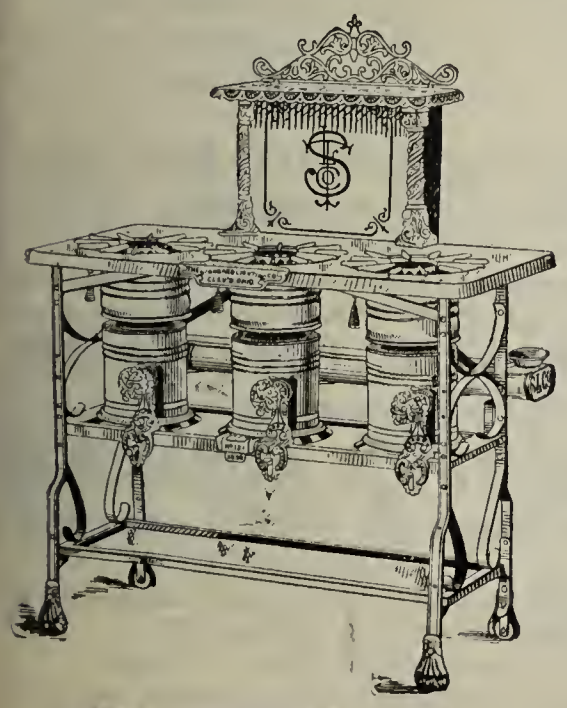
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All our Blue Flame Stoves have Brass Burner Drums. Chimneys are Aluminum Bronze.
Cannot Rust or Burn Out.

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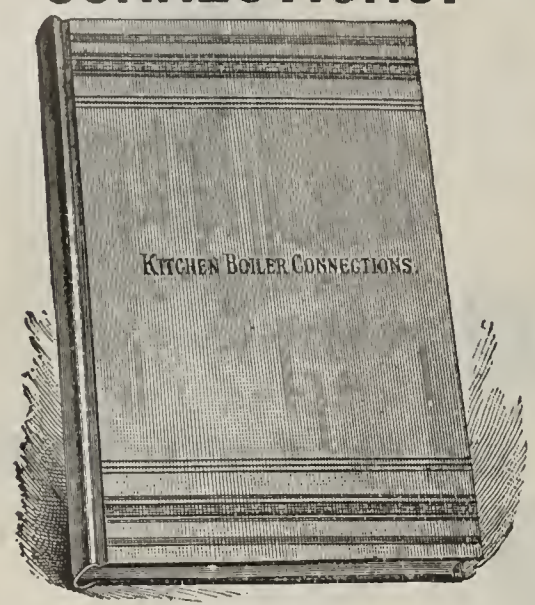
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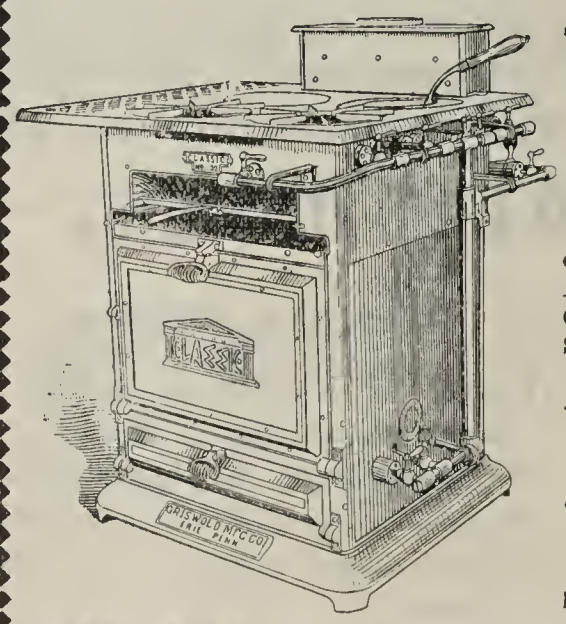
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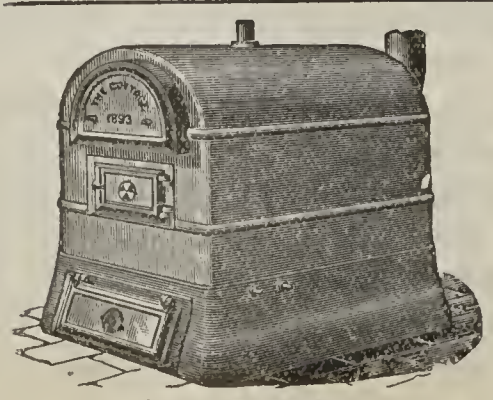
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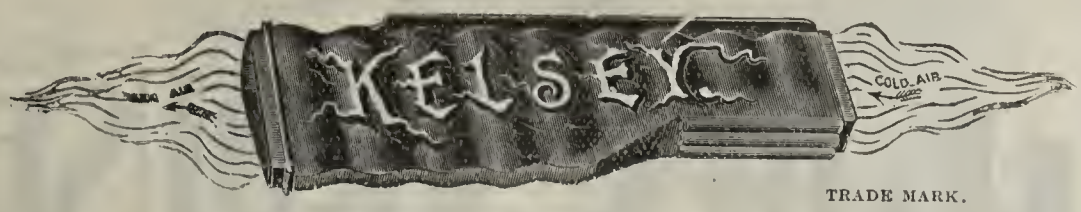
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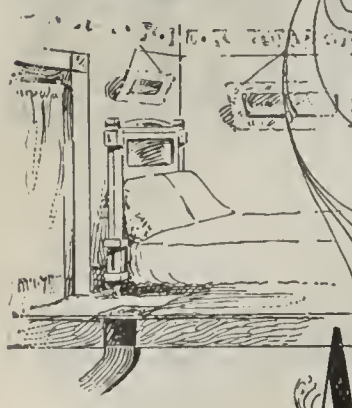
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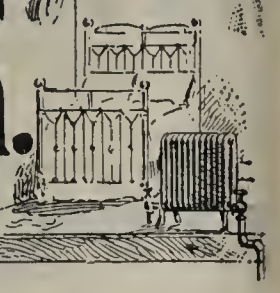
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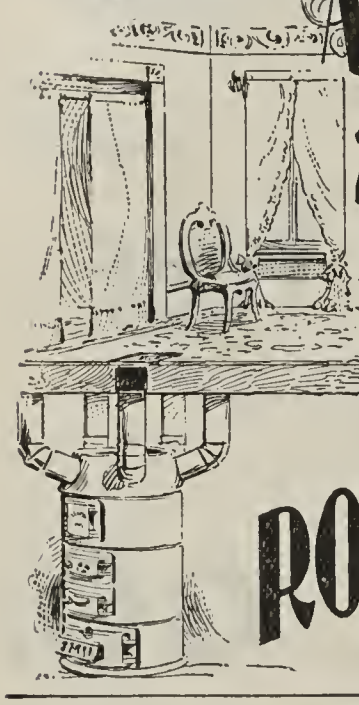


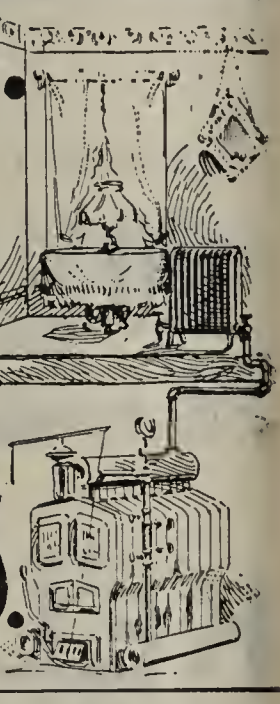


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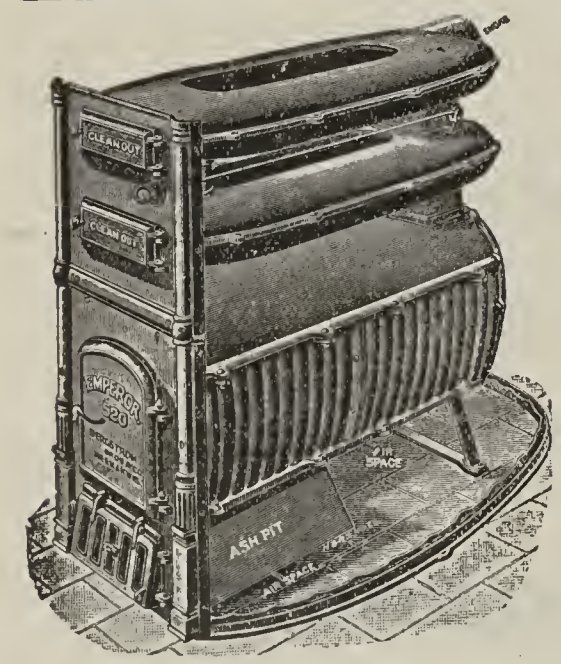
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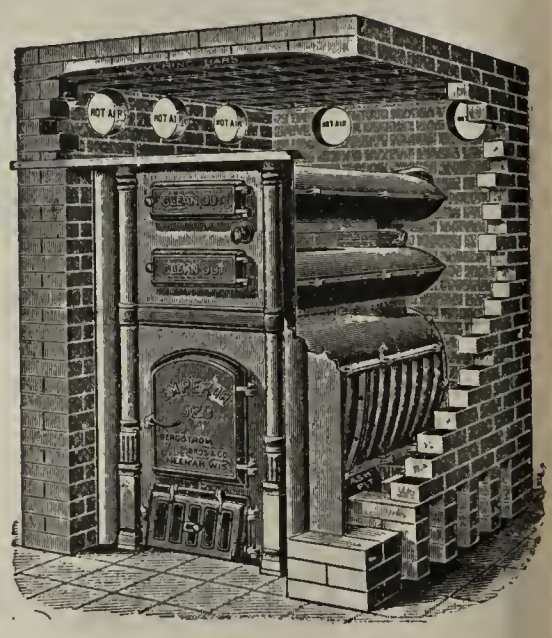
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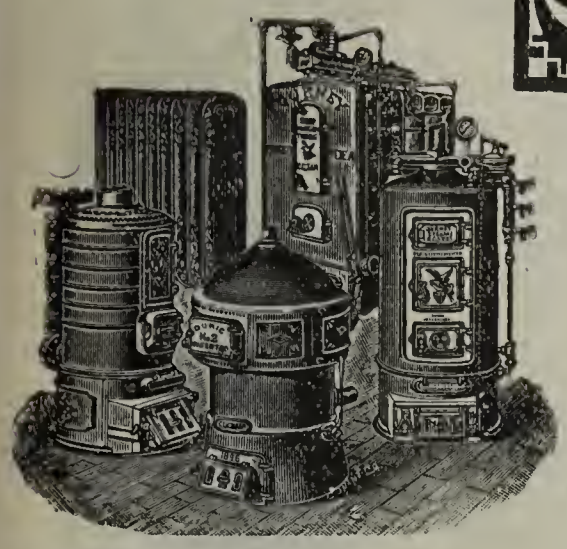
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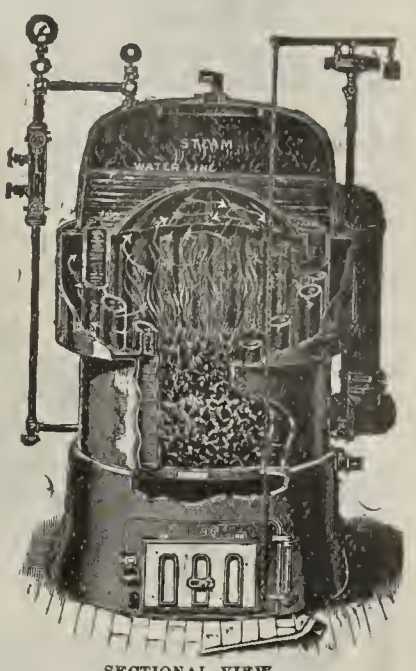
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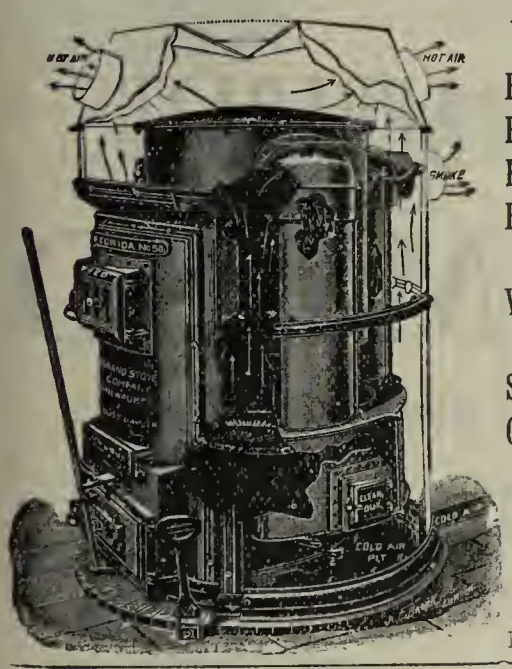
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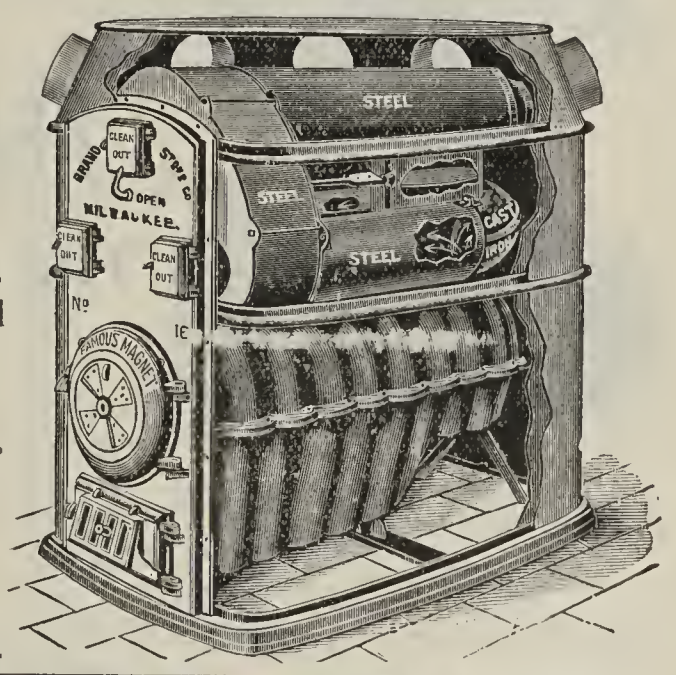


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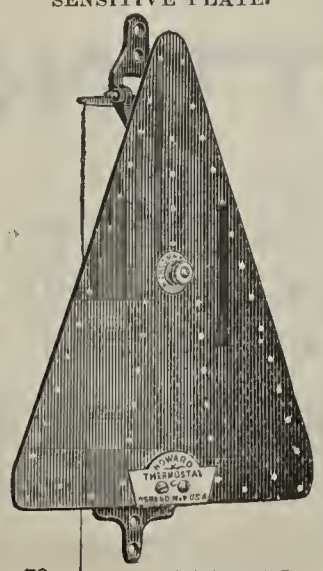
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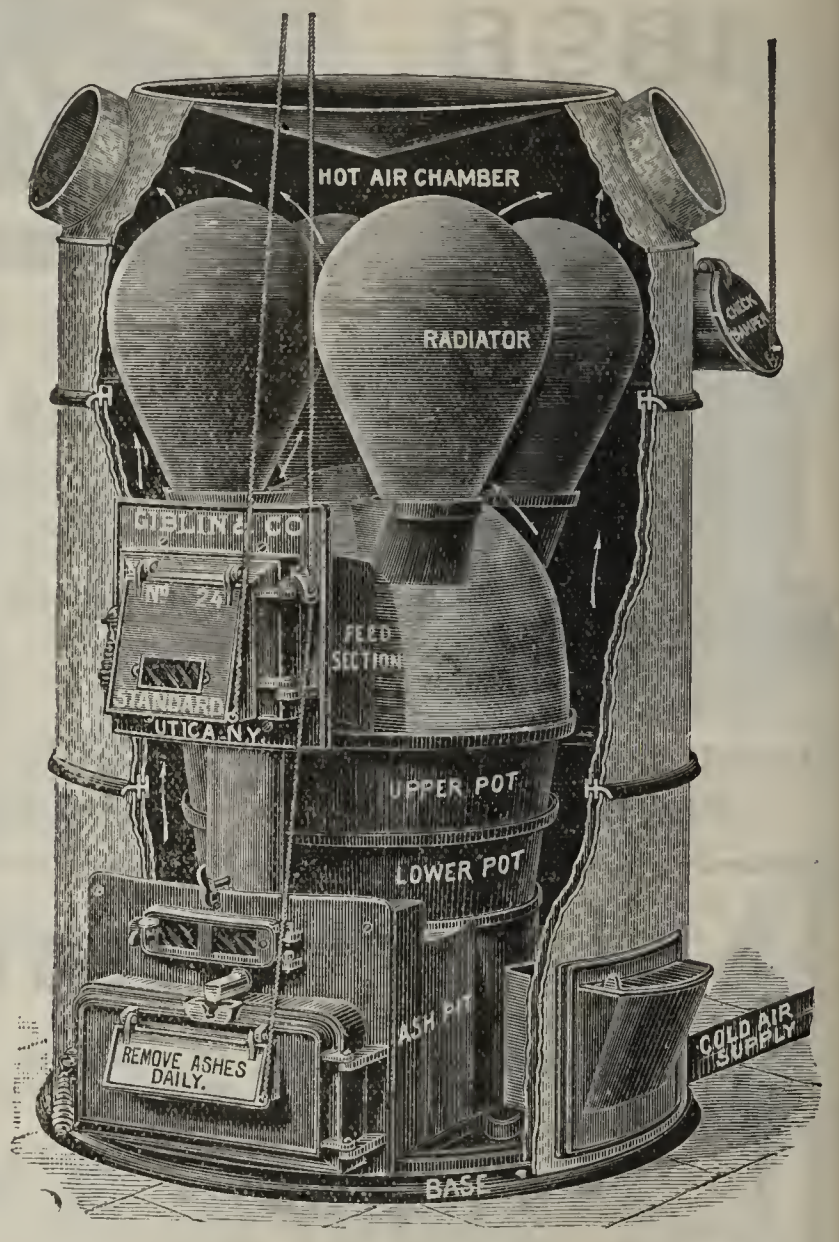
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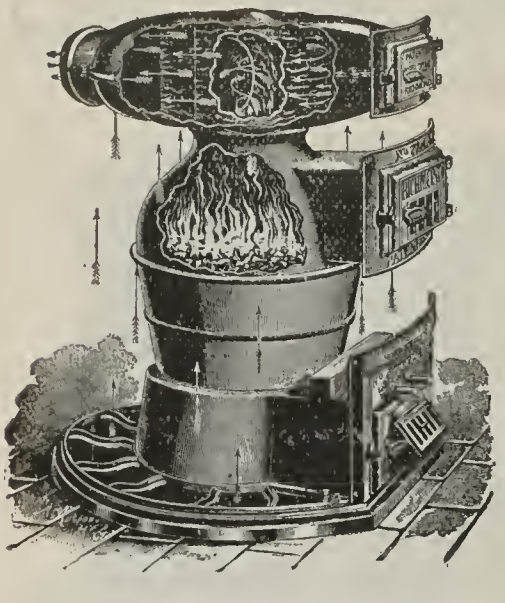
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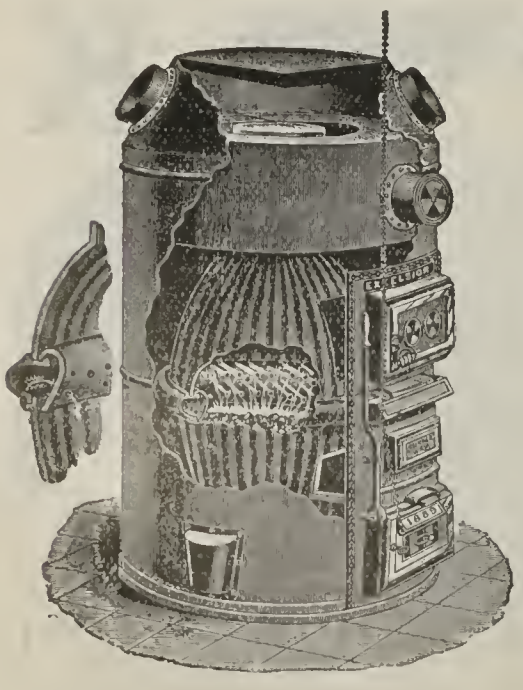
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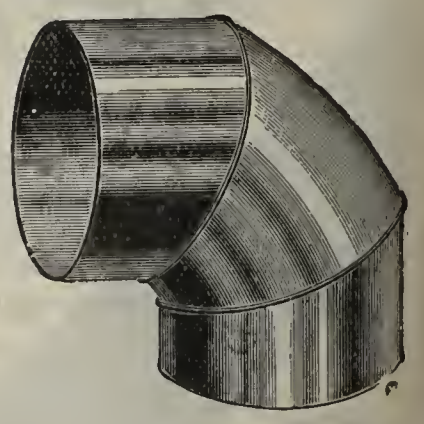
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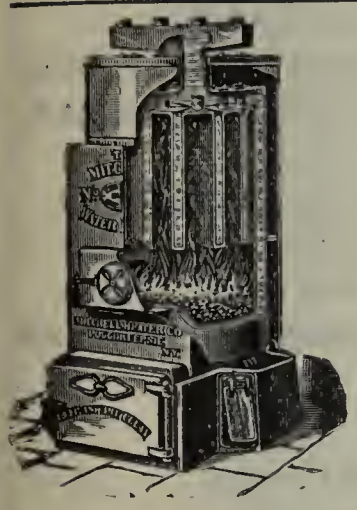
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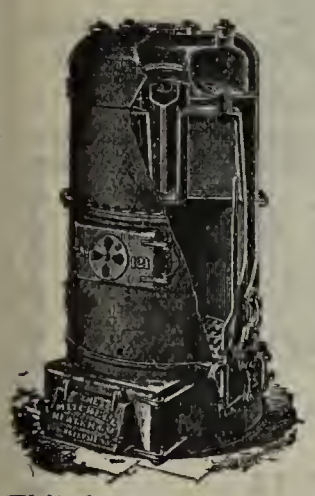
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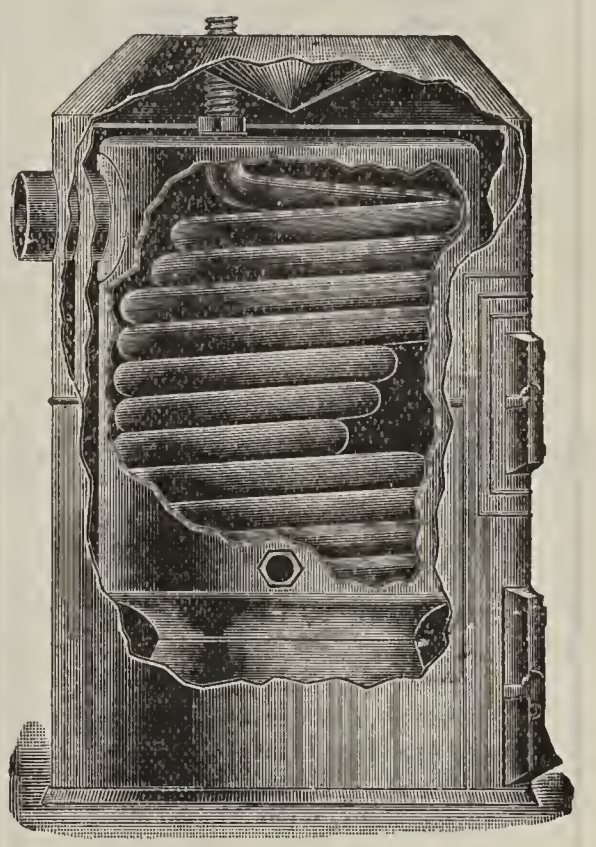
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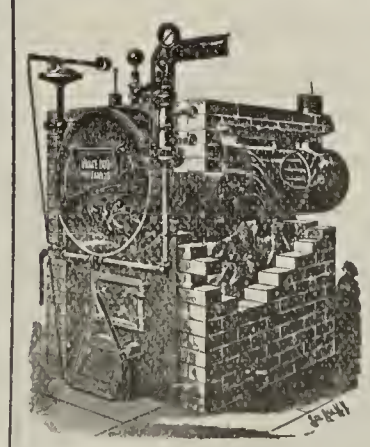
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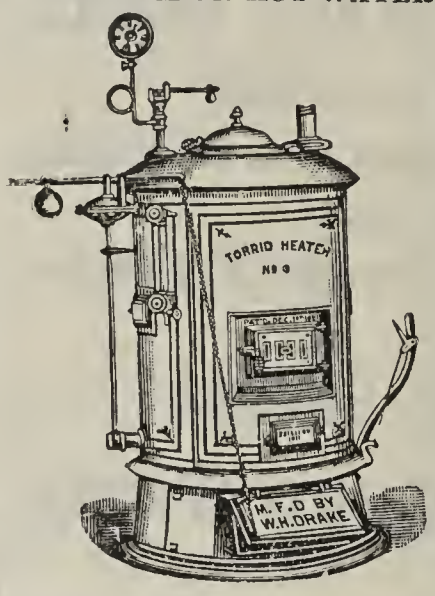
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" 2. General Questions on Heating.
" 3. Low Pressure Steam.
" 4. Two-Pipe Steam Heating.
" 5. Single Pipe Low Pressure Steam Heating.
" 6. Indirect Steam Heating.
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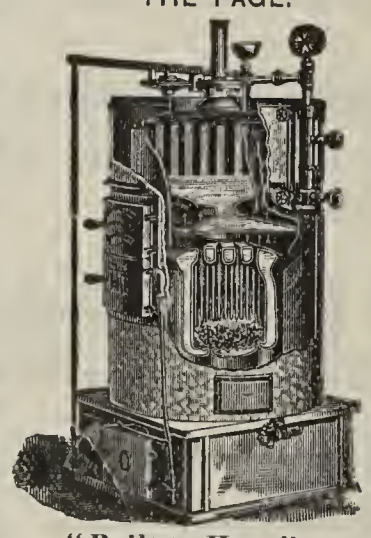


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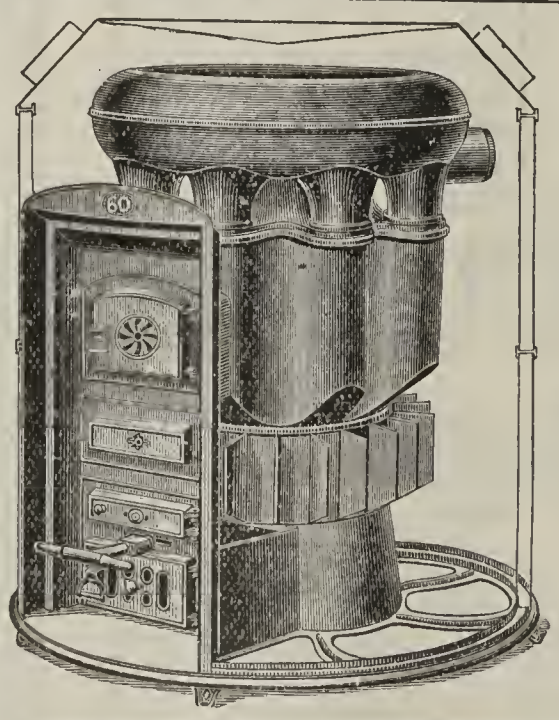
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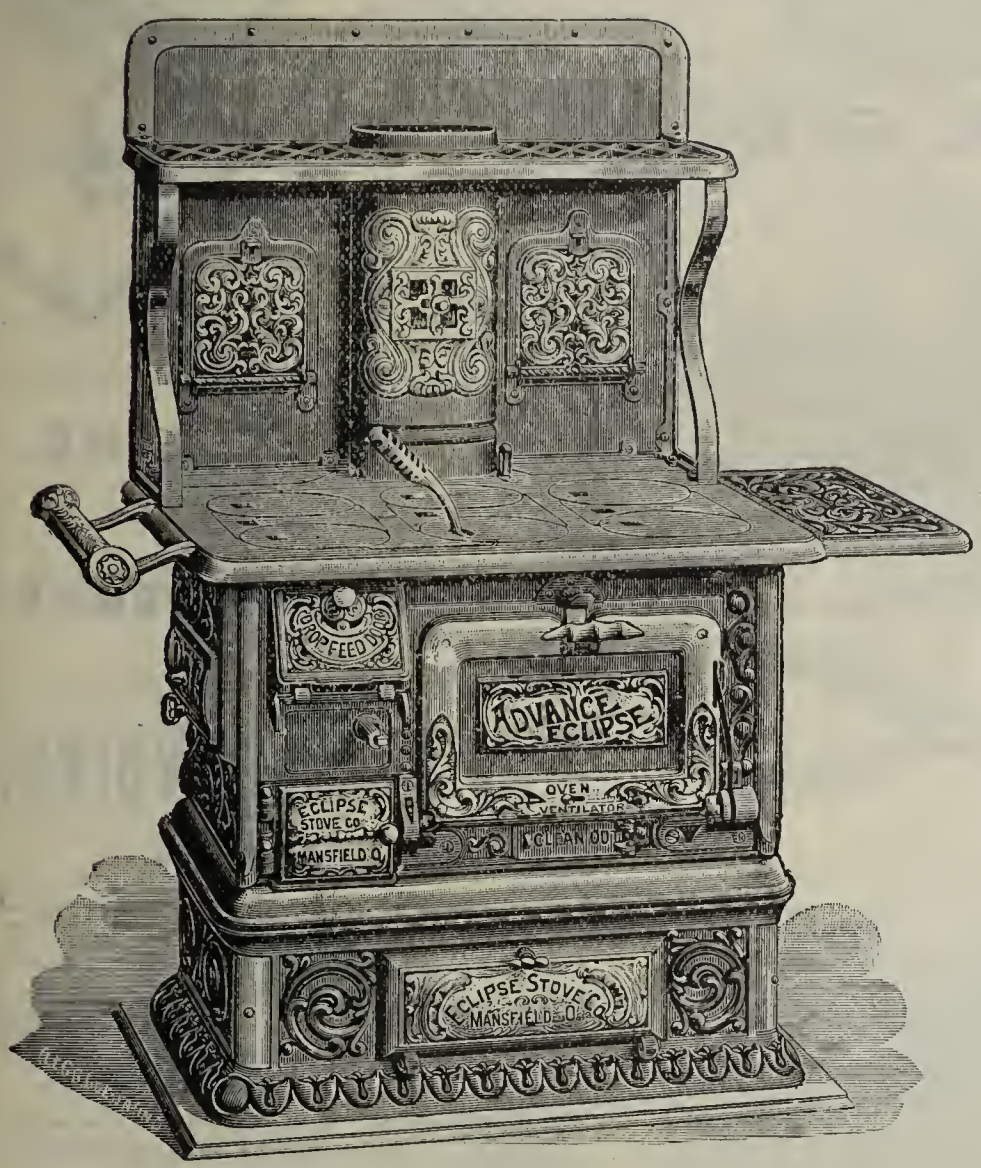
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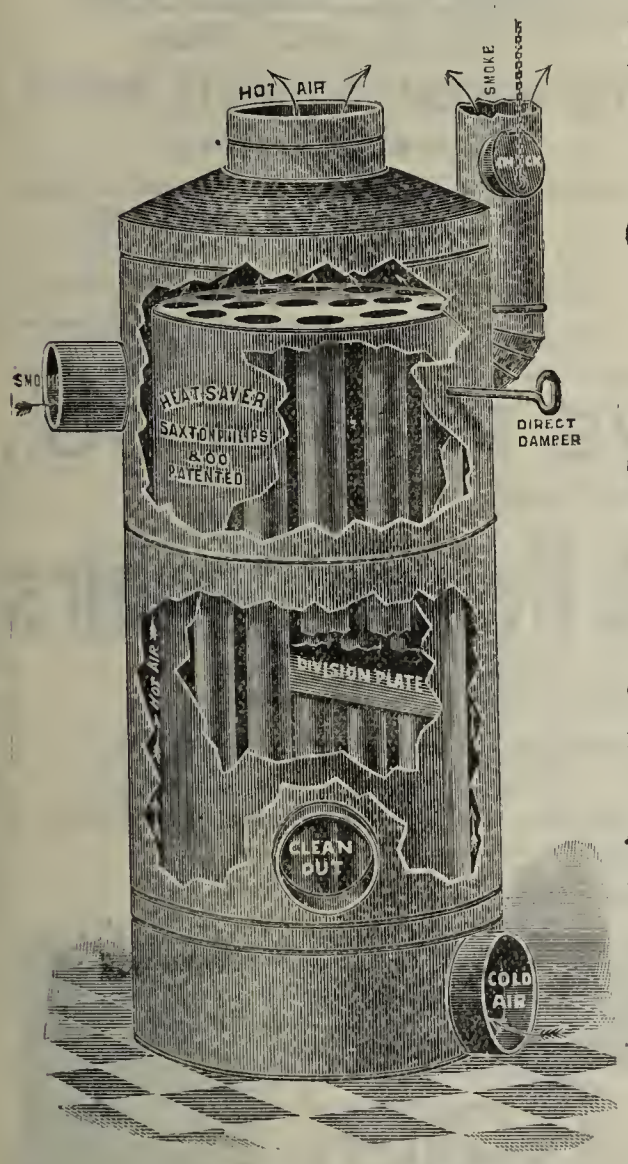
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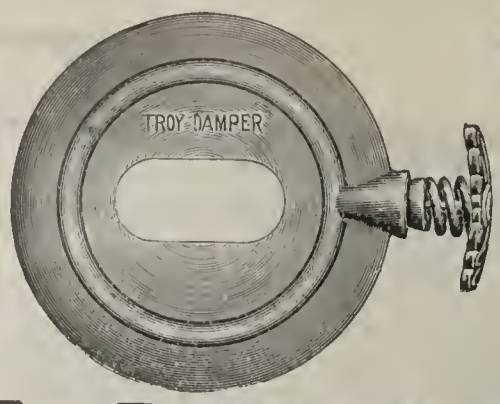
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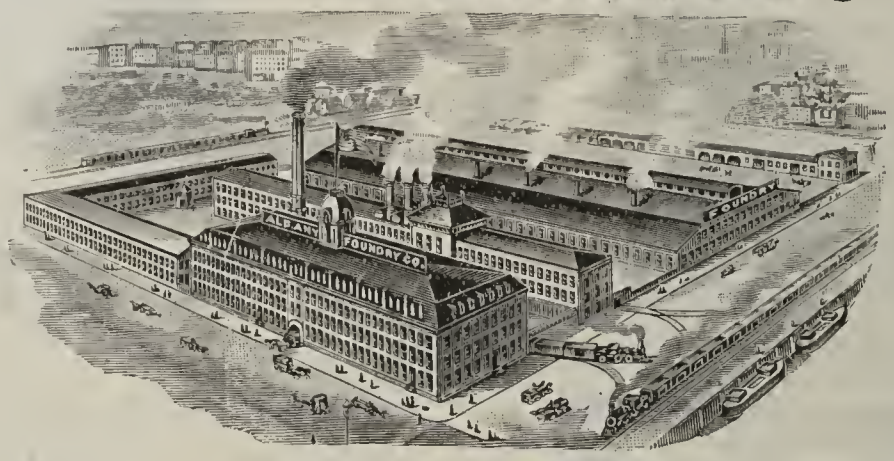
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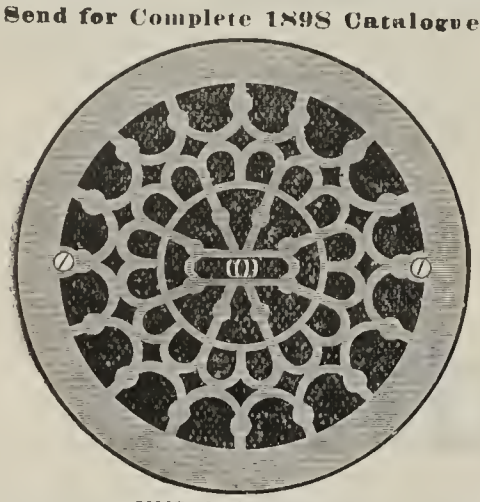
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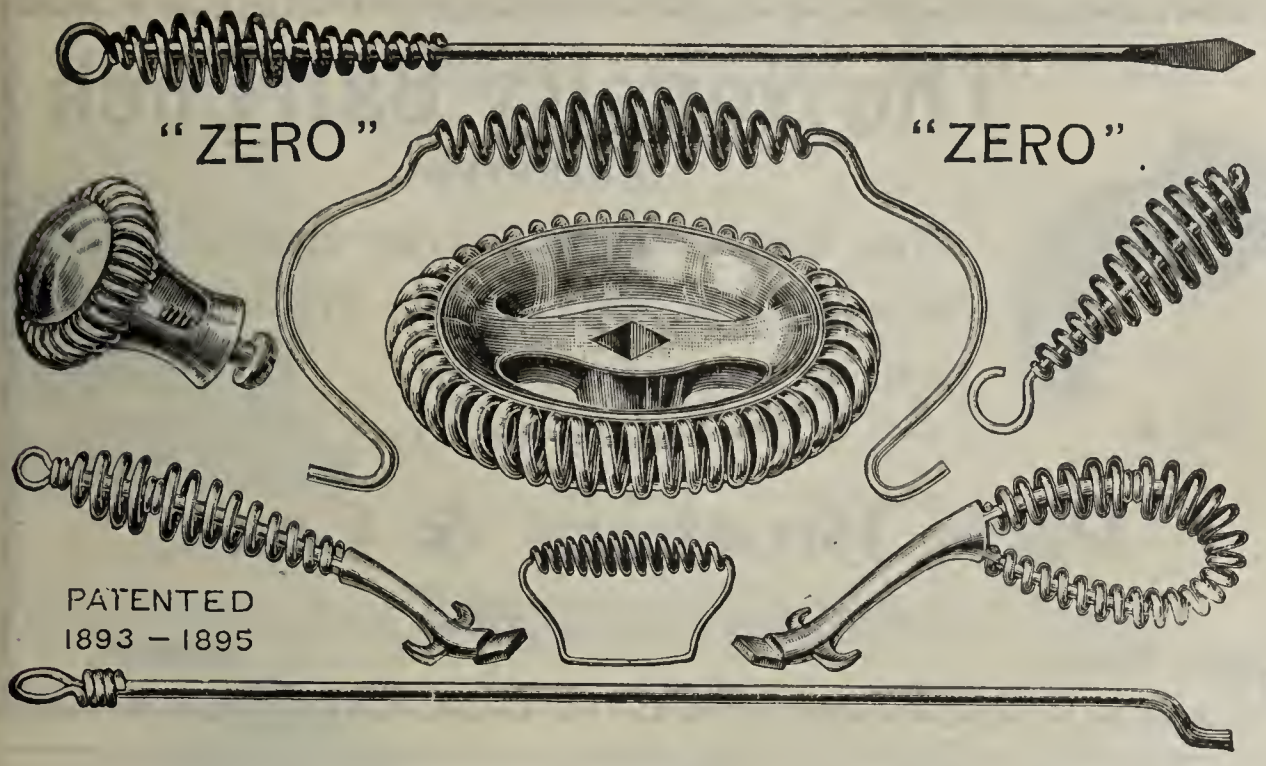
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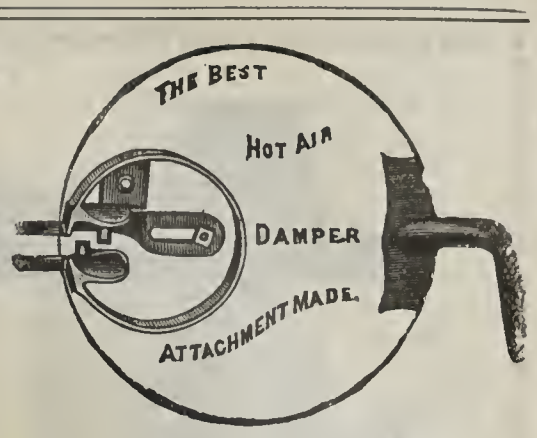
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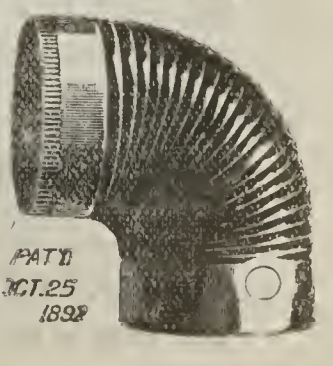
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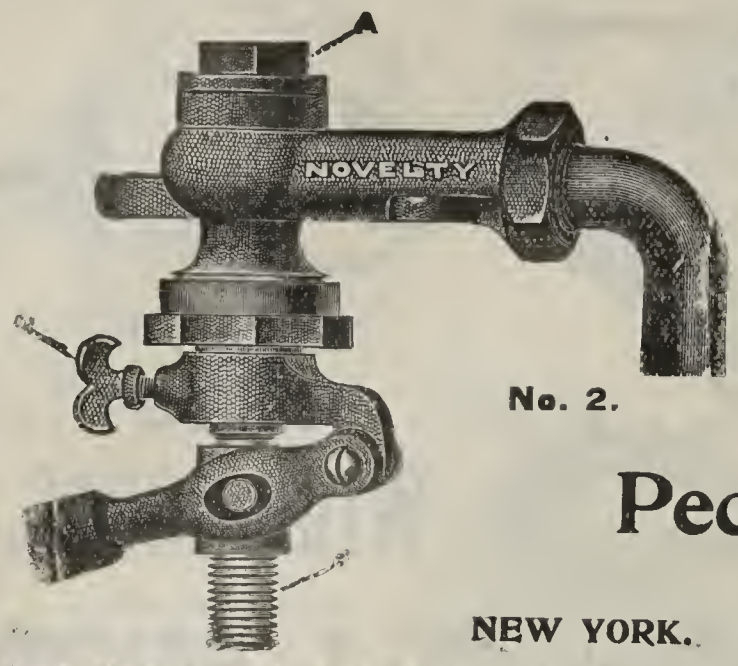
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No. 2.

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(PATENTED).

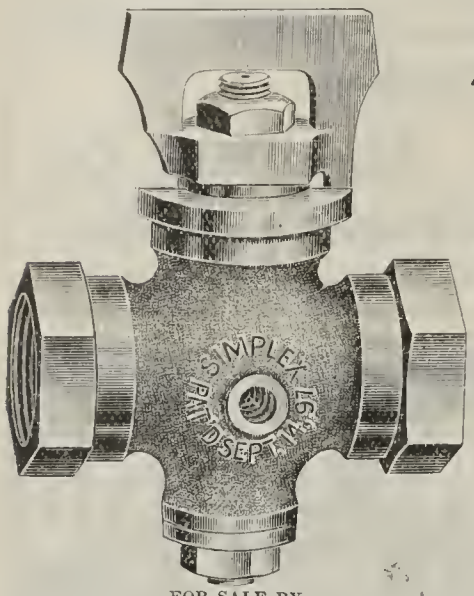
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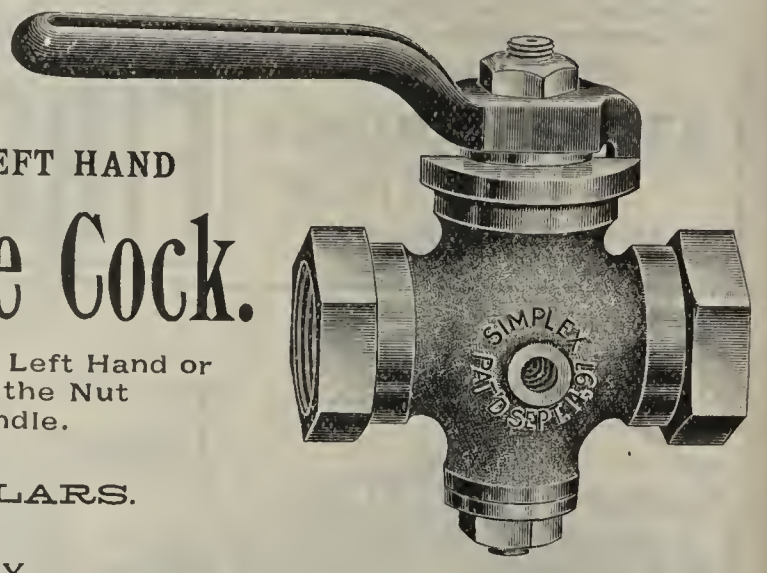
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REVERSIBLE RIGHT OR LEFT HAND

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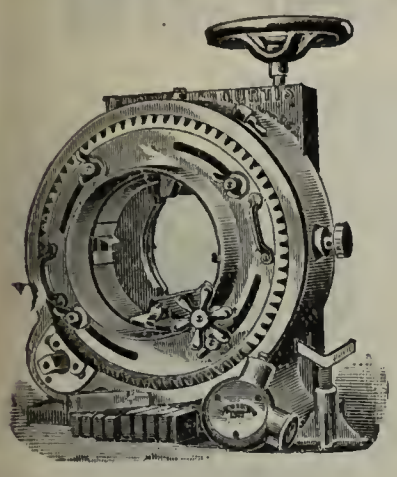
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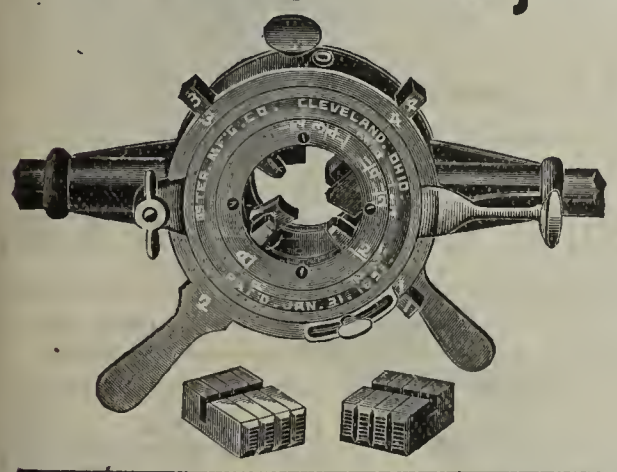
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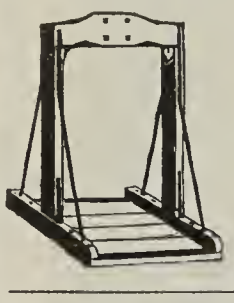
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This manual is, in short, well adapted to the practical requirements of plumbers and gas fitters.

TABLE OF CONTENTS.

FIRST ARTICLE.

Introductory,
The Distillation or Manufacture of Coal Gas,
The Distribution of Gas from the Gas Holder Through the Town,
Connecting the Meter in Buildings,
Inspection of Material and Work,
Laying Out Pipe,
Gas Fitters' Tools,
Piping the Building,
Measuring Pipes,
Cutting the Pipe,
Finding Leaks,
Putting Up Fixtures,
Gas Logs,
Economical Gas Burning.

SECOND ARTICLE.

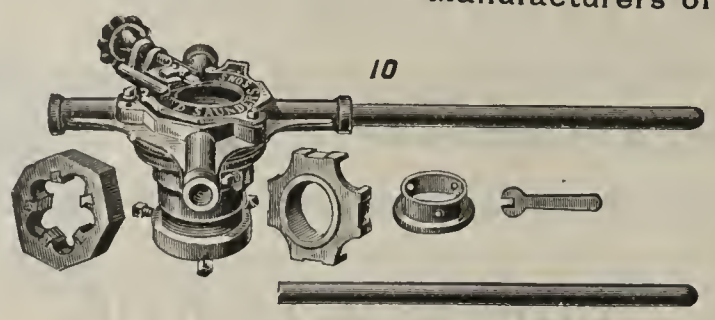
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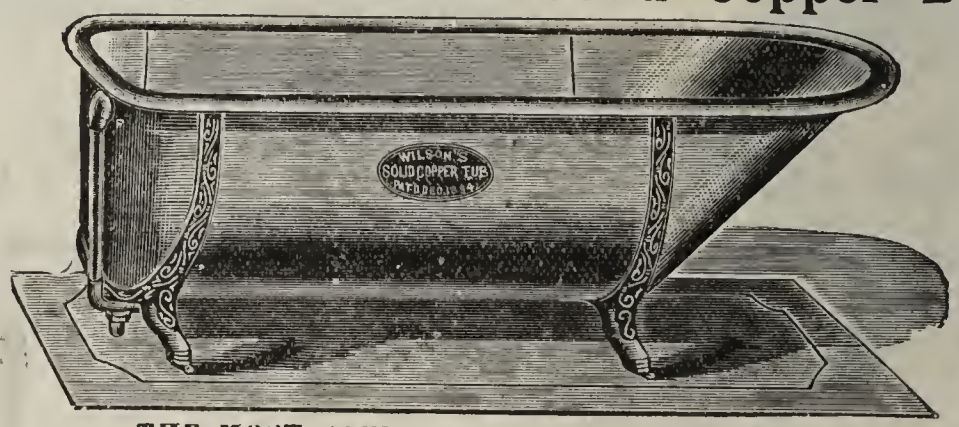
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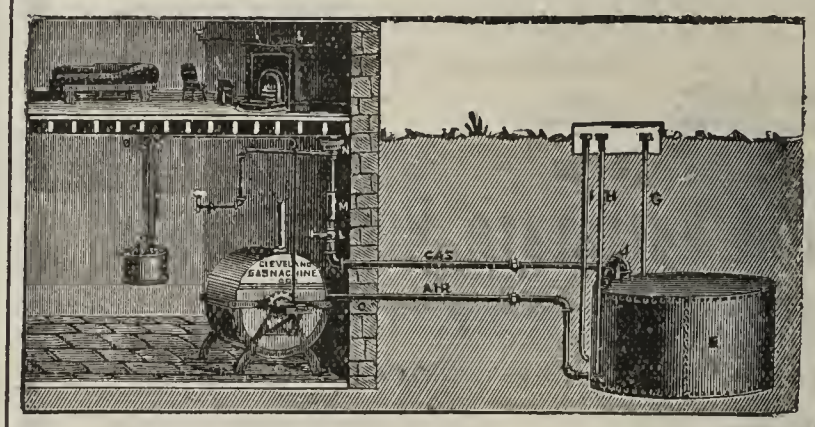
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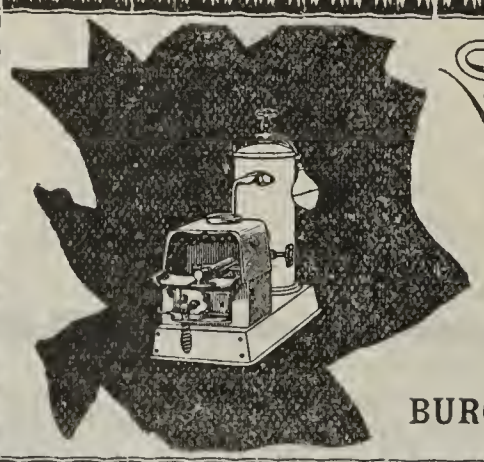
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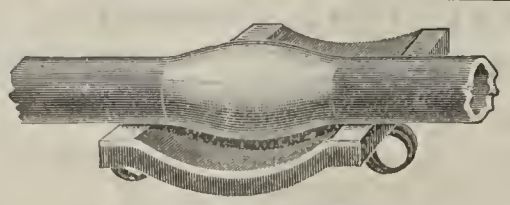
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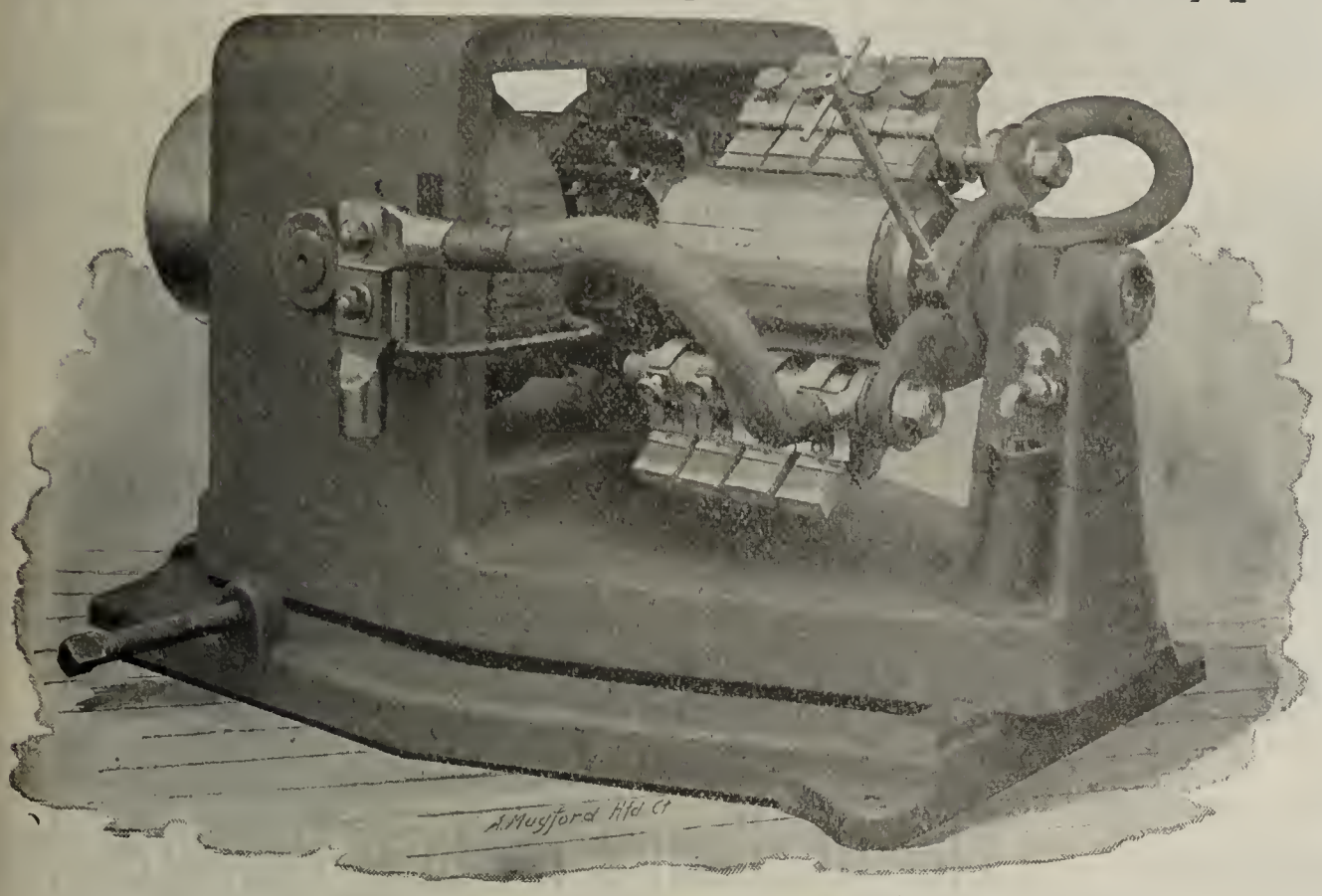
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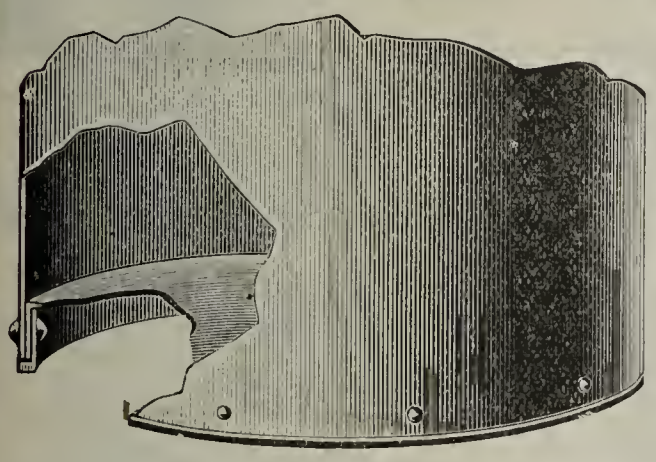


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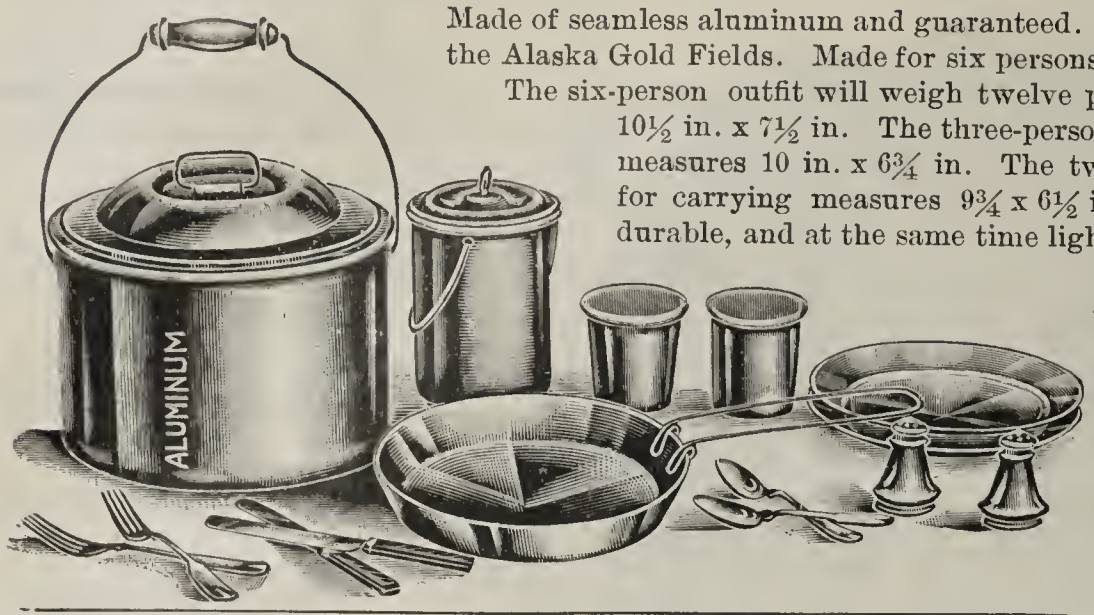
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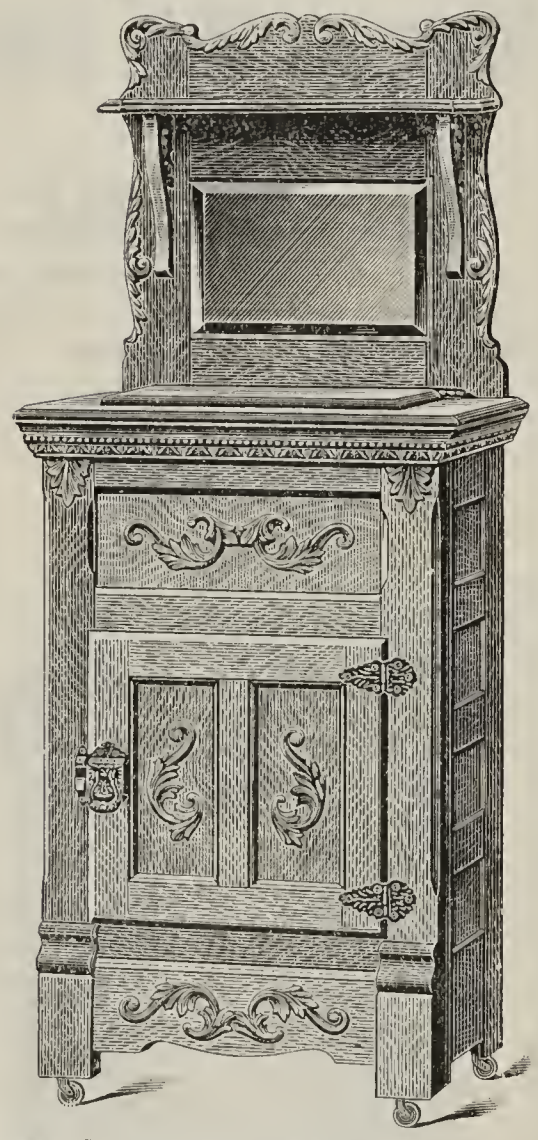
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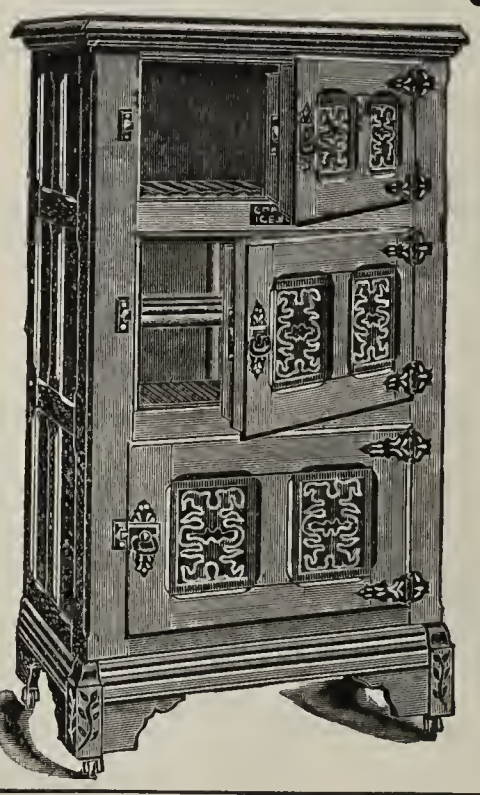
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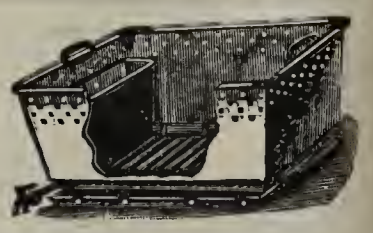
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Challenge Corn Planter Co.,

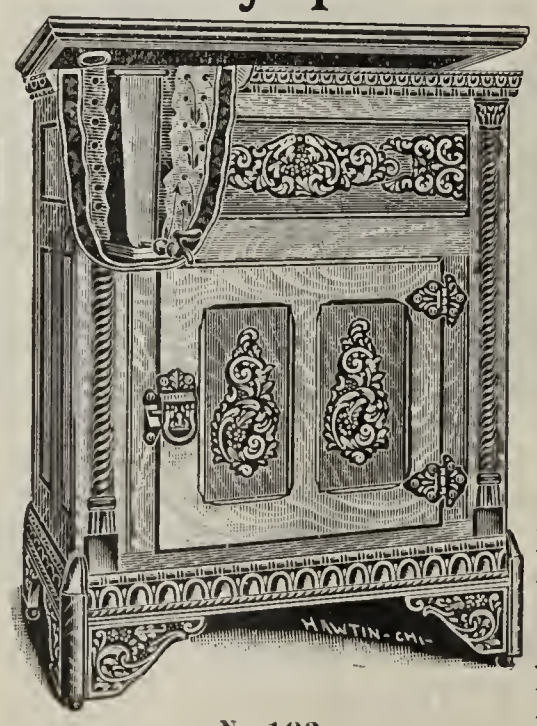
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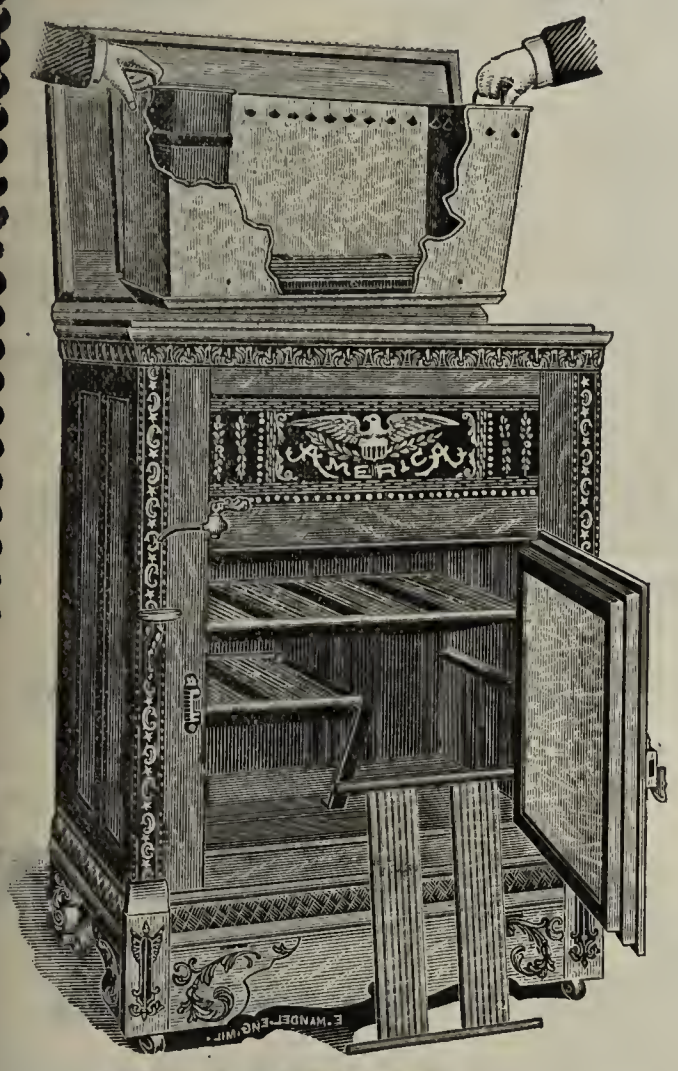
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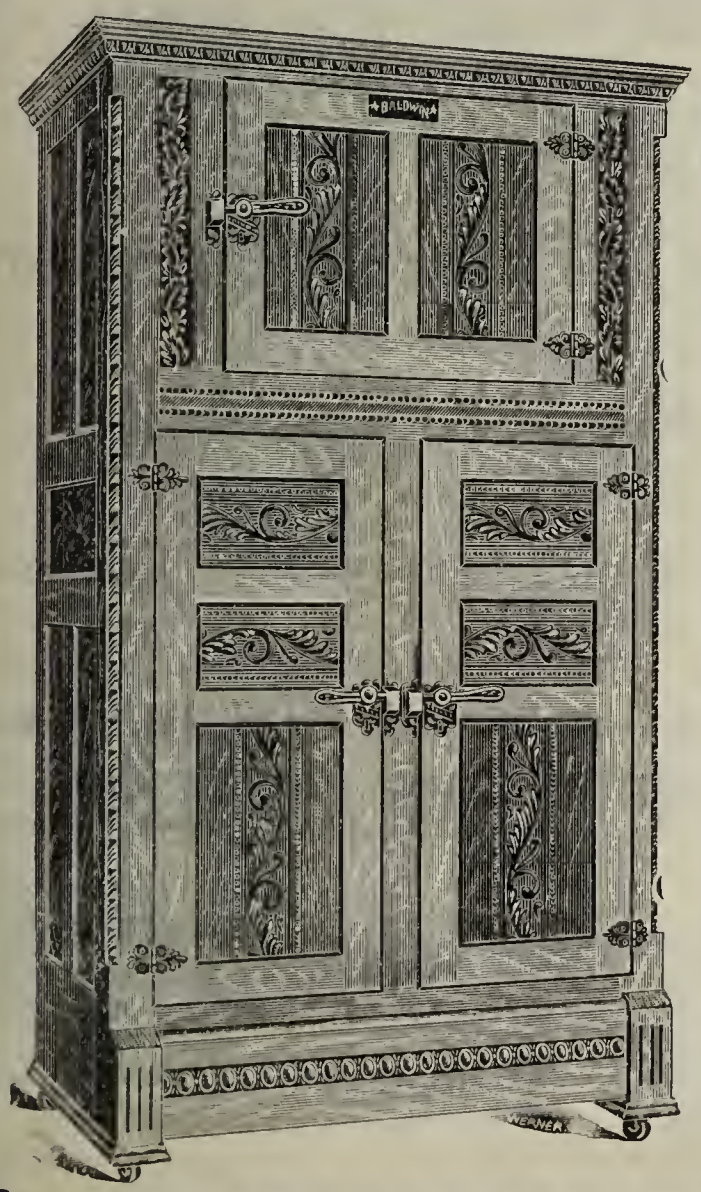
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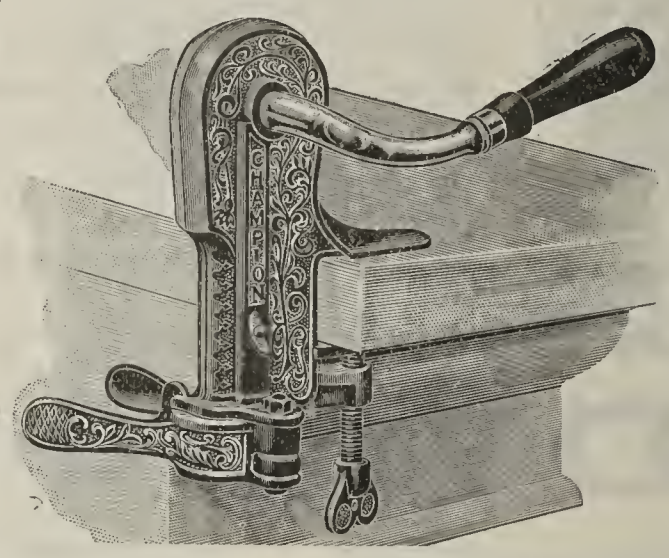
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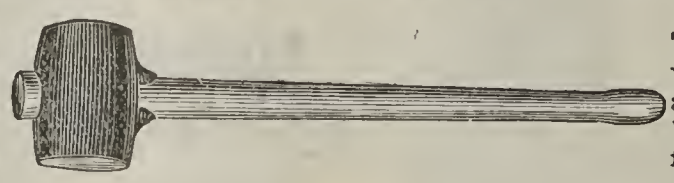
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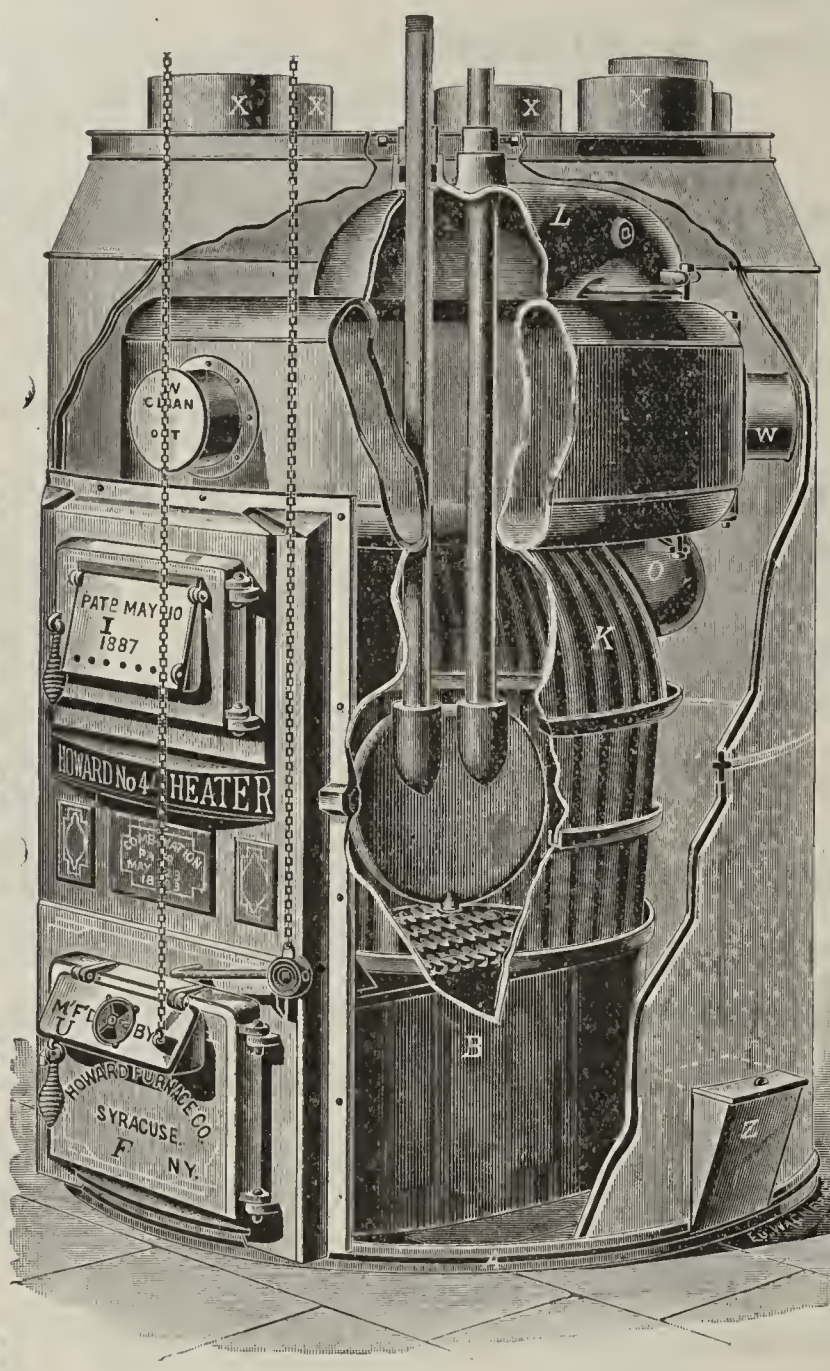
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NEW YORK AND CHICAGO.

Saturday, January 29, 1898.

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The Business Situation.

Notwithstanding that political events during the past week or ten days have been of a somewhat sensational character, the business of the country was little, if at all, affected thereby and their influence, even on the sensitive surface of Wall street, was not seriously disturbing. The dispatch of a United States war vessel to Havana, the warlike occurrences in the far East, the introduction of the Cuban belligerency motion in the House, and the action of the Senate in taking up the Teller resolution for the payment of Government bonds in silver, were each seized upon by the "bear" element as a handle for assaults on stock exchange values, but without permanent success. The stock market at the close of the week showed pronounced strength, while the reports from trade centers indicate a large and growing measure of activity in business and industrial lines throughout the country. The demand for manufactured goods is unusually heavy for the season, surpassing all records in some instances and making a very large aggregate of current trade. Last week the payments through clearing houses were no less than 38 per cent. larger than for the same week of 1897, and 10.4 per cent. above the total clearings for the corresponding period of 1892. In correspondence with these favorable figures are the recent returns of railway earnings, which so far exceed those of the same period in January, 1896, by 17.5 per cent., and those of 1892 by 10.3 per cent. Moreover, the increases are general, extending practically to the entire list of roads. Business failures have been smaller than in any previous year at this time, falling short of last year, both in manufacturing and trading failures, by over 50 per cent. A temporary check to the distribution of goods is noted in the West through the heavy storms and severe weather which have prevailed this week in that section, but the volume of general business, even there, is still exceptionally large. Both manufacturers and merchants take a hopeful view of the situation and the multiplying evidence of reviving enterprise in all quarters is especially gratifying. Increased activity in building is a significant sign of returning confidence, as is an extraordinary expansion of business in the real estate market. Prices show no radical change, except that wheat again advanced to the dollar mark in Chicago. As a whole, prices in all lines remain steady with a rising tendency. Collections are generally reported as satisfactory.

The Manufacturers' Association and the Export Trade.

The report made by President Search to the National Association of Manufacturers this week at their annual convention in New York contains abundant ground for congratulation as well as much food for thought on the part of those interested in the development of the export trade of this country. The statistics of last year's foreign trade show a gain over 1896 of very nearly $200,000,000 in the total exports from the United States, which, for the first time in the commercial history of the country, exceeded a billion dollars. Of this amount, $276,000,000, or nearly 27 per cent., represented exports of manufactures, showing a gain in this department of almost $50,000,000 over the total foreign sales of American manufactured articles in the preceding year. The comparative percentage of manufacturing exports to total exports was also the largest recorded, with one exception. The figures presented by Mr. Search, which go back to 1821, show an almost startling growth in our outward foreign trade. Compared with 50 years ago the total exports have increased tenfold, while the exports of manufactured articles are no less than 17 times greater now than they were then. This tremendous expansion is a gratifying proof of the success our manufacturers have achieved in their invasion of the foreign markets. Mr. Search believes, moreover, that what has been achieved is but a slight suggestion of what will be accomplished in the future in this field when certain limitations, mostly artificial, are removed. First and foremost among these is the shipping question. The fact that the large bulk of American goods is shipped abroad in foreign bottoms is a distinct drawback. At the present time British ships take out $7 worth of our exports to every $1 worth carried in American vessels. The building up of the American merchant marine is a matter that is closely bound up with the development of the export trade. The establishment of a Federal Department of Commerce and Industry, with a Cabinet officer at its head, for the promotion and fostering of the business and industrial interests of the country is also strongly urged. This plan is followed in almost every other civilized country on the globe. The development of better international banking facilities; the promotion of technical education, which more than any other one thing has been the cause of the rapid growth of Germany as a manufacturing and exporting country; and the reform of the consular service, separating it from politics, are dwelt upon as all important questions, on the regulation of which depends in large measure the continued efficiency and expansion of our manufacturing and exporting interests. The extraordinary growth which has marked the foreign trade of this country in the past three years has been coeval with the organization and rise of the National Association of Manufacturers, who have done so much to encourage the export

trade and to stimulate American manufacturers to engage in it aggressively. The association have also initiated what promises to be a most valuable and important movement in the establishment of a sample warehouse for American goods at Caracas, Venezuela. They propose following this step up as rapidly as possible by opening similar establishments at Buenos Ayres, Kobe and Hamburg and ultimately in a number of other foreign commercial centers.

Anthracite Coal Statistics.

The January letter of the Anthracite Coal Operators' Association gives the following tables of the estimates of probable consumption and the shipments for each month of 1897, and their comparison with 1896; also of shipments by regions in 1897 and the five previous years. The October production of anthracite was the greatest for any month in the history of the trade. No estimates of consumption were made for October and November, and mining was pushed to its utmost:

	1897		1896	
	Estimated consumption. Tons.	Shipments. Tons.	Estimated consumption. Tons.	Shipments. Tons.
January	2,500,000	2,854,400	3,844,222	3,844,200
February	2,500,000	2,519,800	2,500,000	2,603,600
March	2,500,000	2,541,000	3,000,000	2,998,300
April	2,500,000	2,552,200	3,000,000	3,013,200
May	2,500,000	2,723,600	3,000,000	3,125,200
June	2,500,000	2,920,000	3,000,000	3,314,200
July	3,500,000	3,975,100	3,500,000	3,750,200
August	3,500,000	4,086,900	4,000,000	3,949,800
September	3,500,000	4,072,500	4,000,000	4,001,600
October (open)	5,120,800	5,120,900	4,500,000	4,783,700
November (open)	4,538,400	4,538,400	4,500,000	4,435,700
December*	3,000,000	3,300,000	3,500,000	3,357,700
Totals	38,159,200	41,204,800	42,344,222	43,177,400

* December, 1897, estimated.

SHIPMENTS OF ANTHRACITE BY REGIONS.

	Lehigh region.		Schuylkill region,		Wyoming region.	
	Tons.	Per cent.	Tons.	Per cent.	Tons.	Per cent
1892	6,451,076	15.4	12,626,784	30.1	22,815,460	54.5
1893	6,892,352	16.0	12,357,444	28.7	23,839,741	55.3
1894	6,705,434	16.0	12,035,005	29.1	22,650,761	54.9
1895	7,298,124	15.6	14,269,932	30.6	24,943,421	53.8
1896	6,490,441	15.0	13,097,571	30.3	23,589 473	54.7
1897*	6,226,300	....	11.956,900	....	23,021,600	....

* Last month estimated.

The promoters of the Pan-American Exposition to be held on Cayuga Island, Niagara Falls, in 1899, have decided to have a genuine novelty in the way of a railway to take the place of such attractions as the Ferris wheel of the World's Fair and of the Eiffel tower of the first Paris Exposition. This railway will be spiral in form and be operated up a tower 400 feet high. The basis of the railway will be a huge circular tower of steel frame work, around which, like the thread of a screw, the spiral railway will run. It will be supported on huge brackets firmly fastened to the frame work of the tower. This tower will have a diameter of 80 feet at the bottom and will taper 30 feet to the 400-foot level, giving a diameter at that hight of 50 feet. In making the ascent the cars will rise 40 feet in making the circle of the tower, or pass ten times around it in making the 400 foot level. The principle on which it will be operated will be very similar to the Mt. Washington and Pike's Peak roads, by means of a rachet rail. The grade of the line will be between 17 and 25 per cent. Every known safety device will be called into service, so that passengers will be better protected than they are while riding in steam or electric lines of to-day. It is proposed to face the seats of the cars outward, or away from the tower, and as the car ascends the view will broaden out until the entire section of country from Lake Erie to Old Ontario will be in full view, also many miles of country on the Canadian side. It will have two tracks, which will be on parallel but independent spirals. Above the landing for passengers there will be a great lantern, a huge globe of heavy glass with a map of the world outlined on it. This lantern will add 100 feet to the hight of the tower. At night the entire structure from top to bottom will be a mass of electric light, and from the top a powerful search light will cast its rays for miles around, lighting up the falls and rapids in regal splendor. Above this still the great glass globe will glow with light from within, all forming one of the most beautiful effects ever seen at a great exposition.

The annual meeting of the Franklin Institute was held in Philadelphia on January 19, when the following officers were elected for the ensuing year: John Birkinbine, president, re-elected; George V. Cresson, vice-president; William H. Wahl, secretary, and Samuel Sartain, treasurer. The annual report of the institute notes the addition of 100 new members during the year.

Antimony.

An official report on the production of antimony in the United States in 1896, by Edward W. Parker, just issued by the United States Geological Survey, contains some interesting information regarding the metal. It shows that the antimony of domestic production supplies a very small proportion of the consumption. The value of the domestic product has exceeded $50,000 in three years only—namely, in 1892, 1895 and 1896—while the imports have fallen below $200,000 only twice in the past 12 years, and have exceeded $400,000 in 1890 and 1892. The product of metallic antimony in 1896 was 601 short tons, valued at $84,290, the largest on record. In the eight years from 1880 to 1887 the production ranged from 35 to 75 tons, while from 1888 to 1894 it averaged a little less than 200 tons annually. During 1895 it jumped to 450 tons, 2¼ times the product of the year before, and in 1896 it was 33⅓ per cent. more than in 1895. In the two last years, however, the product was principally from imported ores.

The only commercial product of antimony obtained in the United States has been in the form of stibnite, or sulphite of antimony. Workable deposits are not found east of the Mississippi, and the Western deposits have only been worked on a comparatively smale scale. The States west of the Mississippi in which ores of antimony have been mined are Arkansas, California, Idaho, Montana, Nevada and Utah. Only two mines, one in California and one in Montana, produced any ore in 1896, and the amount was so small (33 tons in all, worth $1380) as to be hardly worth mentioning. The prices for metallic antimony for the past two or three years have been so low as not only to discourage any attempts to develop new mines, but to cause the closing down of those that were producing.

Smelters report that the low prices of antimony metal have stimulated consumption, and think the outlook is good for the use of antimony in many new processes and manufactures. One of the causes leading to the low prices of antimony in this country is a peculiar one. For many years the smelters depended largely upon domestic ores, but the supply was limited and uncertain, so that the smelters could not work systematically or economically. In 1894 the principal smelting company in the United States moved from San Francisco to Staten Island, and began the use of foreign ores almost exclusively. With a regular supply of ore and regular work smelting was carried on with greater economy, the output has been largely increased and prices to the consumer have been cut in half, having been reduced from 15½ to 16 cents for Cookson's brand in 1892 to 7⅛ to 8⅛ cents in 1896. The product of metallic antimony in 1896 was 601 short tons, the largest on record. In the eight years from 1880 to 1887 the production ranged from 35 to 75 tons. From 1888 to 1894 it averaged a little less than 200 tons annually. During 1895 it increased to 450 tons, 2¼ times the product the year before, and in 1896 it was 33⅓ per cent. more than in 1895.

A review of the prices of antimony ruling during the past seven years shows a history of steady decline. At the beginning of 1890 the price for Cookson's brand was 22½ cents per pound. During 1895 the price ranged from 7¾ to 8½ cents, and in 1896 a shade lower than this. It will thus be seen that in five years there was a decline of over 66⅔ per cent. in price. Since 1892 the decline has been about 50 per cent. In January of that year Cookson's was quoted at 15½ to 16 cents per pound. By December the price had fallen to 11¼ cents. During 1893 prices continued to decline slowly until 10 cents was reached, and in 1894, under continued depression, 8½ cents was quoted before the close of the year. The lowest price reached in 1895 was 7¾ cents, and in 1896, 7⅛ cents.

Antimony is chiefly valuable as an alloy with other metals. It is used to large extent with lead in the manufacture of type metal, to which it gives hardness, and, what is more valuable, it possesses the peculiarity, when used as an alloy, of expanding at the moment of solidifying, thus giving to the type a clean, sharp impression. From 10 to 16 parts of antimony in 100 are used in making britannia metal. Pewter contains about 7 per cent. It is also used in the manufacture of babbitt metal, and it has lately been used as an alloy with aluminum, to which it gives hardness and elasticity. Its effects on some metals is very injurious, particularly on copper, an almost inappreciable amount (one part in a thousand) destroying its good qualities.

On Monday, January 24, the golden jubilee in celebration of the discovery of gold in California in 1848 began at San Francisco. The festivities connected with the celebration are to continue throughout the week, and will culminate in the opening of the Golden Jubilee Mining Fair of California on Saturday. President McKinley will touch the button at Washington which sets the machinery of the fair in motion.

THE LETTER BOX.

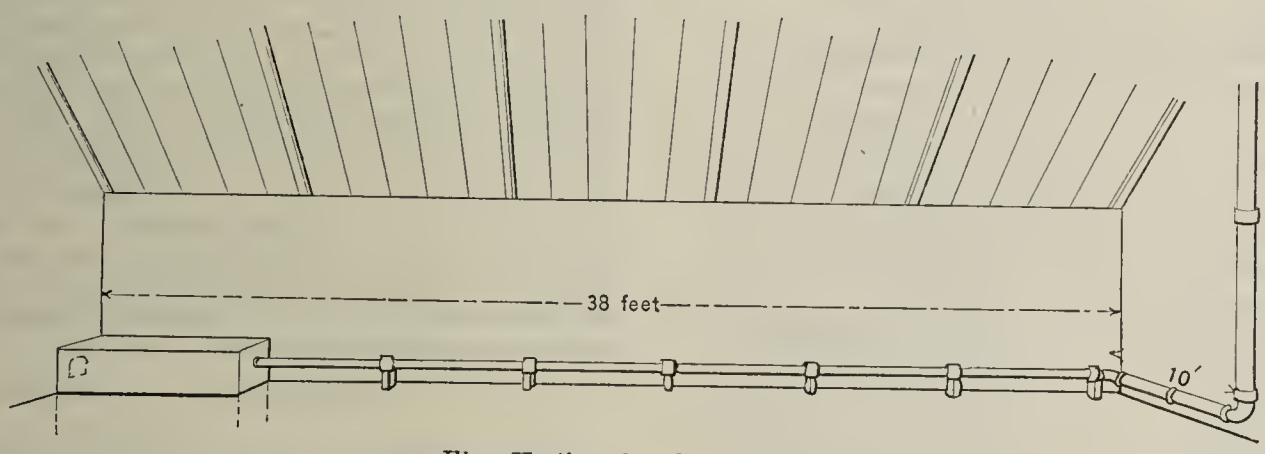
Rating a Boiler.

From T. J. W., New York.—Will *The Metal Worker* inform me how many square feet of heating surface a tubular boiler will carry—a boiler having a capacity of about 30 horse-power?

Answer.—A common opinion in the trade is that 1 horse-power is equal to about 100 square feet of radiation, increasing or decreasing as the conditions may favor or hinder its efficiency. If the boiler in question is a 30 horse-power boiler working under good conditions it will probably carry 3000 square feet of radiation.

Flue Heating for Greenhouses.

From E. C., Saint Joe Station, Ind.—I would like to know if a greenhouse can be heated with a furnace made of brick and with a flue which runs the full length of the greenhouse and across one end, the flue to be made of tile and covered with 12 to 18 inches of brick and stone in order that the fire during the day will make heat enough for the evening. If so, what size tile would be proper to use? The greenhouse is about 38 feet long and 10 feet wide, and the furnace is to be located in one corner and the chimney to be located in the corner that is diagonally opposite. The furnace is to be 5 feet in length, 2½ feet wide and 4½ feet high. The smoke will be taken out of the furnace into the tile and carried along the side of the building across one end to the chimney, as shown in the sketch herewith. Should that tile be 7, 8, 9, 10 or 12 inches in size?



Flue Heating for Greenhouses

Answer.—The danger of a leakage of gas from the joints in the flue, whether it be made of brick or tile, into the greenhouse and ruining the plants, has caused hot water and steam to be looked upon with more favor by those who have had the most experience in the greenhouse business. However, to answer the inquiry of our correspondent, would say that a furnace of the size that he proposes to use is ample for the work, and that the flue which he proposes to use in connection with the furnace will be sufficient to heat the building, but it is quite probable that the fire will have to be continued during the night to accomplish the desired results. Owing to the fact that soot or fine ashes carried through the flue has a tendency to fill it up, it has been found that a flue made of brick 8 inches wide and 12 inches high is better adapted for the work than a tile flue, and when care is taken in building the flue there is much less danger of gas escaping than when tile is used, owing to the fact that it is difficult to keep the joints between the different tiles gas tight. Whether a tile or a brick flue is to be used, it should be supported above the ground so as to prevent the damp cold ground from absorbing the heat of the flue, and also to afford an opportunity for the circulation of the air. A comparatively small hot water heater properly piped would heat the building more satisfactorily, and when the risk of ruining plants is taken into consideration will be cheaper in the long run, even though the first cost is somewhat in excess of what a brick heater with a flue system would cost. If a tile flue is used, not more than 8 inches should be provided or the filling up will require it to be cleaned frequently.

Noisy Faucet.

From B., Port Hope, Ontario.—Will you be kind enough to tell me through the columns of *The Metal Worker* what is the cause and the remedy for a noisy hot water faucet? The firm I work for put in a job of plumbing in a house three months ago, and when the job was completed there was not a sound of anything. Since then the hot water faucet in the bathroom when opened make a rumbling and cracking noise in the pipes throughout the whole house, although for nearly three months this noise did not make itself heard. The water pressure at the point where the house is situated is about 60 pounds to the square inch, and the supply to the house is a ¾-inch pipe with the service cock shut half off in the cellar. The faucets used are the Fuller's improved combination hot and cold.

Note.—Almost invariably the noise heard under the conditions presented by this correspondent is due to some loose part in some one of the plumbing fixtures of the building, not necessarily the one in use. This may be a washer on a bib or the spindle of it, and the only way to locate it is to search until the troublesome part is found and tighten or replace it. The only specific direction which can be given is to examine every fixture till the loose one is found. In *The Metal Worker* of November 27, 1897, under the title of "How to Remedy Water Hammer" this trouble is described, and it is shown how far distant from the effect the cause of the noise may be found.

The annual report of the Board of Managers of the Lake Carriers' Association shows the largest enrolled tonnage in 1897 in the history of the association—namely, 687,237 net registered tons. The report shows that the smaller vessels in the lake service are dropping out and larger ones taking their places. The association are at present working upon a bill which is to be submitted to Congress, embodying a plan for the building up of the American merchant marine.

The National Monetary Convention opened at Indianapolis, Ind., on Tuesday, with 350 delegates.

FOURTH ANNUAL MEETING OF THE AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS.

TUESDAY MORNING.

The fourth annual meeting of the American Society of Heating and Ventilating Engineers was opened at 11 o'clock on the morning of January 25, at 12 West Thirty-first street, New York City, by the president, W. M. Mackay. The meeting was marked by the deep interest taken in the society by its members and those invited as guests. Among those present were the following:

MEMBERS AND GUESTS.

W. M. Mackay.
A. E. Kenrick.
J. A. Goodrich.
S. A. Jellett.
W. F. Wolfe.
B. H. Carpenter.
W. H. Kent.
J. Gormly.
A. T. Henderson.
H. H. Ritter.
H. J. Barron.
J. J. Blackmore.
A. A. Cary.
C. F. Hauss.
T. B. Cryer.
W. H. Dewey.
John A. Fish.
W. S. Hadaway.
C. S. Hopkins.
E. A. Munro.
G. W. Plastow.
U. G. Scollay.
L. B. Sherman.
J. R. Wendover.
F. A. Williams.
Geo. H. Weymouth.
Geo. P. Steel.
Geo. I. Rockwood.
T. C. Northcott.
Hugo Ehrenburg of Hamburg, Germany.
E. O. Haskins.
W. P. Saylef.
Chas. A. Miller.
Gustav Koven.
H. Stauffer.
K. Ohmes.
Warren Webster.
Frank McLain.
E. N. Squires.
Leonard Tapley.
J. W. Gifford.
R. C. Hawkin.
Mark Dean.
Geo. I. Howey.
E. D. Smith.
Hayden W. Wheeler.
H. M. Norton.
F. M. Wilmot.
Geo. B. Cobb, Jr.
A. C. Mercer.
O. C. Wells.
Henry Adams.
H. M. Swetland.
B. F. Stangland.
H. A. Joslin.
N. P. Andrus.
A. Harvey.
J. A. Connolly.
J. G. Sorgen.
A. H. Fowler.
G. M. Langdon.
Thomas Barwick.
R. C. Carpenter.
George B. Cobb.
A. A. Cryer.
A. C. Edgar.
C. F. Gessert.
W. H. Hill.
Wm. McMannis.
H. D. Crane.
W. A. Russell.
P. H. Seward.
W. O. Steele.
R. P. Bolton.
W. H. McKiever.
A. G. Paul.
Wm. S. Washburn.
David W. Meeker.
Walter C. Meeker.
C. C. Buck.
Francis Schumann.
Thomas E. McNeill.
L. O. Koven.
F. K. Chew.
W. McMann.
W. Nygren.
F. Webster.
E. C. Moses.
Wm. Brownback.
J. R. Vance.
H. R. Stickney.
J. Englis.
James Curran.
Geo. Coppins.
Henry B. Gombers.
H. L. Hall.
F. H. Bowen.
Thomas Hyde.
Joseph Wright, Toronto, Can.
Richard Reed.
Chas. S. Wood.
Thomas Edwards.
R. M. Geddes.

Immediately after the roll call, President W. M. Mackay read his annual address.

PRESIDENT'S ADDRESS.

It gives me pleasure to welcome you to this, our fourth annual meeting, which I trust will prove interesting and beneficial to all. While there has been no marked improvement in the condition of business or trade during the past year, our society has not suffered from the general depression, but has grown steadily in point of numbers, those admitted to membership during the year amounting to fully 25 per cent. of our former membership, and coming from all sections of this country and Europe, showing that the interest manifested in advancing this, our chosen profession, is not local, but universal. No special effort has been made to increase the membership of the society, the majority of the applicants soliciting the honor rather than being solicited, which would indicate a recognition of the standing of the society and the necessity for a united action to elevate and advance our profession.

THE SPREAD OF KNOWLEDGE.

Our society has already been the means of accomplishing much good in diffusing a knowledge of the requirements and the best methods employed in securing good heating and ventilation, which we claim to be a necessity, and while some have felt that the imparting of information and data gained by years of application and study, and sometimes by a large expenditure of money used in costly experiments, would be injurious to the occupation of the heating and ventilating engineer, it has been found that a more general public knowledge of the requirements and apparatus best suited for accomplishing the purpose has increased the demand for competent heating and ventilating engineers and the use of scientifically designed materials and systems of heating and ventilation, and still what has already been accomplished sinks into insignificance when compared with the possibilities of a society like ours with a membership embracing the leading men in the profession in all sections of the country. A united effort on the part of the individual members of the society will in time awaken the different State and municipal governments to the fact that good heating and ventilation are necessities and not luxuries, and will secure for our profession the same recognition and legislation as is accorded to other professions of no greater importance.

To accomplish the greatest amount of good for ourselves and others, it is desirable that we should avail ourselves of every opportunity to advance the interests of the society, that in electing officers and appointing committees we should select those who can best fill the different positions and who are willing to devote a reasonable amount of time to the affairs of the society. We should also endeavor to increase our membership by securing as members or juniors all who are eligible for such membership. This can be best accomplished by the individual members in the different sections of the country where they are located. The officers of the society can be assisted in conducting the affairs of the society by a free discussion on the part of the members of Topic No. 4, presented at this meeting.

AMENDMENTS AND SUGGESTIONS.

The members will be called upon to vote on several additions and amendments to our constitution as recommended by the committee appointed to consider this matter at the last annual meeting and handed in in writing by the members.

The first change suggested is to strike out the age limit for members and juniors. The second amendment relates to the meetings of the Board of Managers and the Council, and defines more clearly the duties of the Council. The third amendment provides that our constitution may be amended at any regular meeting of the society by notifying the members of such amendment in writing at least 60 days in advance of the annual meeting The fourth amendment is to correct an error in regard to those entitled to vote; and the fifth amendment provides that the president and secretary shall be members of the Council as well as members of the Board of Managers, and that by this change the Council be increased to seven instead of five members.. As all of these changes, as suggested, are the result of careful consideration, and seem to be for the best interests of the society, I would ask for them your attention, consideration and judgment. We have adopted a society badge or button. It is worn by a number of our members, and I would suggest that all of our members who wish to be known as belonging to our society procure and wear this emblem. A number of our members use the name of the society on their stationery and cards. It is desirable that all members should avail themselves of this privilege.

The question of a summer meeting, as provided for in our by-laws, was left in the hands of the Board of Managers with power at our last annual meeting, and they arranged a meeting at the Windsor Hotel, in this city, on the evening of June 18, 1897. That meeting was so successful, so largely attended and brought our society into such prominence that I would strongly urge that you follow the same course this year.

COMMITTEE REPORTS.

Our Committee on Uniform Contract and Specifications will submit their final report at this meeting. Our Committee on Compulsory Legislation have been active during the year, assisted by individual committees and

members in the different States, and they will, no doubt, be able to report substantial progress since the last annual meeting. Our Committee on Standards will possibly have some additions to offer to their last year's report, and I trust that by another year we will be able to devote a certain amount of the funds of the society to be used by the Committee on Tests in making such tests as they may decide on, and the reports of which will be of value to the society.

The proceedings for 1897 were delayed in order to include a report of the summer meeting. They have now been completed and have been sent forward to the members entitled to them. I learn that some of the members did not receive the 1896 "Proceedings." Those who did not can obtain them by corresponding with the secretary.

The impression has been created that because a number of papers presented at the meetings of the society related to the construction of fans and blowers and the installation of these systems we as a society were only in favor of mechanical means for procuring ventilation. I wish to correct this impression and to say that as a society we do not indorse any system or method to the exclusion of any other. We ask that certain results be obtained, whether it be by steam, hot water, hot air, electricity, natural or mechanical means, and we number in our ranks the exponents of all these systems and some who use different systems to meet different conditions or requirements.

It has been stated that because the question of heating related more to personal comfort than to health, we should not ask that the heating of buildings be regulated or enforced by legislation. I believe that heating is more of a necessity than a luxury in this country, and that it is wrong to compel children and others to occupy buildings that are improperly or imperfectly heated; and while I am a strong believer in and advocate of good ventilation, I believe that heating and ventilation should go hand in hand, and that when a public building is insufficiently heated it should be condemned until remedied, in the same way that we would ask the State governments to act in regard to buildings having insufficient and imperfect or defective ventilation. I say this, believing that a large amount of sickness and death, particularly among children, is due to buildings which they occupy not being properly or uniformly heated.

REPORTS.

The report of the secretary, which was next presented, showed the affairs of the society to be in a prosperous condition and contained the gratifying announcement that the membership during the past year had increased 20 per cent.

The treasurer's report showed an increase in receipts and a decrease of expenses, with a larger balance in the treasury.

The report of the Board of Managers showed that frequent meetings had been held, and spoke of the successful summer meeting which accounted for the delay in issuing the book of "Proceedings" for 1897.

The Council reported that greater care should be taken in filling out applications for membership, and also stated that the future of the society was bright and increased interest was being taken in it. A summer meeting was strongly advised.

The following list of new members for the year was then announced:

NEW MEMBERS.

Juan A. Almiral, New York.
Reginald P. Bolton, New York.
W. H. McKiever, New York.
Frank K. Chew, New York.
C. Wadsworth, New York.
Robert Campbell, New York.
J. A. Gorton, New York.
George O'Hanlon, New York.
Henry C. Meyer, Jr., New York.
R. E. Atkinson, Leicester, England.
Samuel M. Green, Holyoke, Mass.
Sanford C. Smith, Buffalo, N. Y.
Nelson S. Thompson, Washington, D. C.
E. T. Weymouth, Brooklyn, N. Y.
Geo. E. Adams, Glens Falls, N. Y.
J. S. Farrell, Indianapolis, Ind.
Charles G. Folsom, South Bend, Ind.
J. W. Gifford, Attleboro, Mass.
Samuel Graham Neiler, Chicago, Ill.
F. H. O'Neill, Philadelphia, Pa.
Oliver Schlemmer, Cincinnati, Ohio.
E. P. Sparrow, Malden, Mass.
W. H. Switzer, Little Falls, N. Y.
Wm. S. Washburn, Brockton, Mass.

JUNIOR MEMBER.

H. H. Ritter, New York.

ASSOCIATE MEMBER.

Henry A. Smith, New York.

The Committee on Compulsory Legislation stated that bills had been presented in the Pennsylvania and New York Legislatures, and that legislation regarding better ventilation could be secured if active interest was taken in the subject by the members, and representatives waited upon the proper committees of the various legislatures.

The Committee on Standards reported that they had sent cards to the school authorities in 150 towns, asking questions as to the systems in use, the amount of air supplied per pupil per hour, the space allotted per pupil, the floor area allotted per pupil, and the number of pupils to a room. Thirty-four answers were received, which the committee tabulated, showing that all methods were used, from stoves to the modern fan system; that from 1200 to 2000 cubic feet of air per hour was provided in the better buildings; that from 175 to 250 cubic feet of space was allotted per pupil, and from 10 to 25 square feet of floor space, with an average of 15 square feet, per pupil, and that an average of 40 pupils occupied each room.

The president appointed as tellers J. G. Sorgen, N. P. Andrus and A. H. Fowler.

AMENDMENTS.

Amendments to the constitution were taken up, and Sections 2 and 3 of Article 2 were amended by eliminating reference to age.

Article 5 was amended so that the president and secretary are members of the Council.

Article 10 was altered so that the constitution may be amended at any regular meeting, the proposed amendments to be presented to the members at least 60 days prior to the meeting.

Article 6 was amended by the elimination of the word associate.

The meeting then adjourned.

TUESDAY AFTERNOON.

On the opening of the afternoon session the president introduced to the members Hugo Ehrenburg of Hamburg, Germany, who was followed by George I. Rockwood of Worcester, Mass., who read a paper on a new type of hot blast radiator, and which is printed in part elsewhere.

After this had been thoroughly discussed a paper was read by John Gormly, Philadephia, on "Some Experiments in Steam Circulation," which is printed in another column.

Discussion of this paper tended to the conclusion that the trouble was largely due to faulty boiler construction and to improper piping in connection with boilers restricted in steam space and not arranged for a free internal circulation.

On motion a committee consisting of W. F. Wolfe, B. H. Carpenter and H. J. Barron was appointed to visit schools in New York City representative of past and present practice of heating and ventilation and report to the society.

Topical discussion was then taken up.

TUESDAY EVENING.

On opening the evening session the president announced that Thomas E. McNeill extended an invitation to the members to visit the New York Trade School.

The report of the tellers showed the election of the following officers, which was formally announced by the president:

President, Wiltsie F. Wolfe.
First Vice-President, J. H. Kinealy.
Second Vice-President, A. E. Kenrick.
Third Vice-President, John A. Fish.

Secretary, S. A. Jellett.
Treasurer, J. A. Goodrich.

Board of Managers.

W. M. Mackay. Francis A. Williams.
Thomas Barwick. John A. Connolly.
A. C. Mott.

Council.

R. C. Carpenter. W. S. Hadaway.
A. A. Cryer. Henry Adams.
Wm. McMannis.

A paper was then read by Prof. R. C. Carpenter on "A Test of the Heating and Ventilating Plant. New York State Veterinary College, Cornell University, Ithaca, N. Y."

This paper and the discussion occupied the evening until adjournment.

WEDNESDAY MORNING.

The morning session, which was opened at 10.45, began with a paper read by J. J. Blackmore on "Proportioning of Circulating Pipes for Steam and Hot Water Heating Systems." This paper will be found on another page of this issue.

Professor Carpenter stated that new tables had been made by both himself and Mr. Wolff better adapted for general use, and that the data quoted were based on certain conditions, and he submitted a formula for the preparation of the table, giving the amount of radiation that can be carried by a given pipe of given length. We print below the two tables referred to. The first is by Professor Carpenter:

SIZE OF STEAM MAINS.

Commercial Sizes of Steam Mains for a Single Pipe System of Heating by Direct Radiation; Pressure, 0.5 Pound; Friction Resistance, 6 Inches of Water for Lengths of 100 feet, 12 Inches of Water for Greater Distances.

Radiating surface, square feet.	Length of steam main, feet. 20	40	80	100	200	300	400	600	1000
20	1	1	1¼	1¼	1¼	1¼	1¼	1½	1½
40	1¼	1	1¼	1¼	1¼	1¼	1¼	1½	1½
60	1¼	1	1¼	1¼	1¼	1¼	1¼	1½	1½
80	1¼	1	1¼	1¼	1¼	1¼	1¼	1½	2
100	1¼	1½	1½	1½	1½	1½	1½	1½	2
200	1½	2	2	2	2	2	2	2½	3
300	2	2	2	2	2	2½	2½	3	3½
400	2	2	2½	2½	2½	3	3	3	4
500	2	2½	2½	3	3	3	3½	3½	4
600	2½	2½	3	3	3½	3½	3½	3½	4½
800	2½	3	3½	3½	3½	3½	4	4	5
1,000	3	3½	3½	4	4	4	4	4½	6
1,400	3½	3½	4	4	4	4½	4½	5	6
1,800	4	4	4	4	4½	5	5	6	7
2,000	4	4	4	4½	4½	5	5	6	7
3,000	4½	4½	4½	5	5	6	6	7	9
4,000	5	5	5	6	6	7	7	7	9
6,000	5½	5½	6	7	7	7	7	8	10
8,000	5½	5½	6	7	7	8	8	9	11
10,000	6	6	6	7	8	8	9	10	12
12,600	6	7	7	7	8	8	10	11	12
14,000	7	7	7	8	9	9	10	12	14
16,000	7	8	8	9	9	10	11	(?)	14
18,000	8	8	8	9	10	11	11	(?)	14
20,000	9	9	9	10	11	11	12	14	16

In using the above table take the equivalent lengths as explained on page 226 of Carpenter's "Heating and Ventilating Buildings."

A. R. Wolff's Table for the Capacity of Steam Pipes, with Separate Returns, 100 Feet in Length.

Diameter of supply in inches.	Diameter of return in inches.	2 pounds pressure. Total heat transmitted in B. T. U.	2 pounds pressure. Rad. surface, sq. ft.	5 pounds pressure. Total heat transmitted in B. T. U.	5 pounds pressure. Rad. surface, sq. ft.
1	1	9,000	36	15,000	60
1¼	1	18,000	72	30,000	120
1½	1¼	30,000	120	50,000	200
2	1½	70,000	280	120,000	480
2½	2	132,000	528	220,000	880
3	2½	225,000	900	375,000	1,500
3½	2½	330,000	1,320	550,000	2,200
4	3	480,000	1,920	800,000	3,200
4½	3	690,000	2,760	1,150,000	4,600
5	3½	930,000	3,720	1,550,000	6,200
6	3½	1,500,000	6,000	2,500,000	10,000
7	4	2,250,000	9,000	3,750,000	15,000
8	4	3,200,000	12,800	5,400.000	21,600
9	4½	4,450,000	17,800	7,500,000	30,000
10	5	5,800,000	23,200	9,750,000	39,000
12	6	9,250,000	37,000	15,500,000	62,000
14	7	13,500,000	54,000	23,000,000	92,000
16	8	19,000,000	76,000	32,500,000	120,000

In the above table each square foot of radiating surface is assumed to transmit 250 heat units per hour as safe and conservative as treated, as will be seen by consulting Chapter IV of Carpenter's work on heating. For pipes of greater length than 100 feet multiply results in the above table by the square root of 100, divided by length. In all cases the length is to be taken as the equivalent length in straight pipes of pipe, elbows and valves, as given on page 226.

For other lengths multiply above results by following factors:

Length of pipe	200	300	400	500	600	700	800	900	1,000
Factor	0.71	0.58	0.5	0.45	0.41	0.38	0.35	0.33	0.32

For example, the capacity of a pipe 8 inches in diameter and 800 feet long would be 0.35 of 12,800 square feet of radiating surface = 4480 square feet. It will be noted that the size of the return specified by Mr. Wolff is about one pipe size greater than is believed to be necessary by the author (Professor Carpenter), but sizes of main steam pipes are in substantial agreement with tables on page 226.

H. C. Meyer, Jr., then read a paper by Prof. J. H. Kinealy on "The Effect of the Hights of Walls on the Amounts of Heat Transmitted Through Them." This paper is printed elsewhere.

George I. Rockwood read a paper by Mark Dean on "Single Pipe Low Pressure Steam Heating," which is printed elsewhere.

WEDNESDAY AFTERNOON.

The afternoon session opened at 2 o'clock with the resumption of the discussion on the paper on "Single Pipe Low Pressure Steam Heating System."

Topical discussion was opened on the topic, "Does Our Society as at Present Conducted Meet the Objects of Its Organization as Laid Down in Article I of the Constitution?"

Mr. Rockwood urged that the objects of the society could be expressed more briefly, and favored explaining more fully the duties of the Council and secretary.

The general impression, as shown by the discussion, was that the society had become established very quickly, that its value was becoming more generally known, and that it was already following a course that had advanced its interests in the best way.

Discussion was asked on the following topic: "What Size Reducing Valve Is Required to Deliver the Steam and Fill a 10-inch Pipe at 1 Pound Pressure, the Steam Being Reduced from 8 Pounds to 1 Pound Pressure?"

H. J. Barron: I believe that it is better to use a valve on the large pipe and to put a reducing valve on a by-pass around the valve.

S. A. Jellett: We have never used larger than a 4-inch reducing valve in our work.

A. G. Paul: In some plants we have found the use of a large valve necessary.

The committee which visited schools reported that a school representing past practice had been examined briefly, and a steam plant that had been in use probably 20 years was found. The radiation was of the direct character, and in one room there was an open fire place, and with this and the windows down at the top a fair atmosphere was found. In a classroom of the same building the air had to be diluted by opening the windows to make the atmosphere tolerable. In the halls semidirect radiators were placed, but as the vent registers were near the ceiling there was little benefit.

A modern plant visited provided a good atmosphere throughout. There were both blower and exhaust fans, and a high pressure boiler to supply the engines for running the fans, and two low pressure boilers for the heating coils and semidirect and direct radiation. The fresh air was taken through a duct extending 35 feet high. The heated air was discharged at an opening in the window sill to prevent falling cold air from the glass surface. Sixty-five pupils were found in rooms that should have been occupied by but 45, but as 225 cubic feet of space per pupil was provided the atmosphere was good. This plant, though hurriedly looked over, reflected credit on the contractor in the workmanship, and on the City of New York for its high grade of heating plants.

B. F. Stangland read the experience of an early advocate of school ventilation from a pamphlet by Hayden W. Wheeler, who started to work for better school ventilation in Brooklyn in 1881. He found many schools where but 60 cubic feet of space and as little as 2 square feet of floor space was provided. He suggested that each mem

ber examine the schools in his vicinity and report at the next meeting.

THURSDAY MORNING.

On opening the morning session a letter was read from D. Ewart, chief architect Public Works Board at Ottawa, Canada, asking for an expression of the views of the members as to the relative value of box coils and cast iron radiators as heaters when the coils are covered with a marble slab at the top and screens at the side.

Joseph Wright of Toronto, Canada, then explained that the construction of box coils aided in the accumulation of dust, interfering with radiation, while vertical cast iron radiators prevent the dust from depositing.

Under discussion it was deemed that in meeting the conditions of practice the coil radiator was sometimes impaired in efficiency, but could not be considered as 20 years behind the times, as mentioned in the letter. The arrangement of marble tops and screens should be such as to allow a free circulation of air and permit the surface to be readily cleaned. Other remarks were as follows:

W. M. Mackay: In removing an old system that had been in use for 15 years I found an accumulation under the radiator and above it under the slab that more nearly resembled hair felt than anything generally known. This naturally impaired the circulation, and consequently the efficiency. In practice the efficiency of a coil has been demonstrated as 15 per cent. superior to cast radiators.

H. J. Barron: The efficiency of the coil is conceded, but as to the progress in the trade, the handsome cast iron radiator, conforming to the architectural and other requirements, certainly represents a very decided advance.

A. H. Fowler: Tests have recently been made with a cast iron radiator that showed an efficiency superior to iron pipe coil.

Joseph Wright: I am fitting up a building now on an entirely different plan of heating, changing the air every 15 minutes, although the outside air is frequently from 15 to 25 degrees below zero, but the system was not designed by an architect, as the heating system was where the incased coil radiator under discussion was specified.

H. C. Meyer: I would like to ask about the relative durability of cast and wrought iron pipe for the purpose.

Joseph Wright: I have never had trouble with cast iron pipe, but have had wrought iron pipe give out in ten years, and have taken out other coils that were in good order after 20 years of service.

On motion the president was empowered to appoint members from different States to act in conjunction with the regular Committee on Compulsory Legislation.

On motion the president was authorized to appoint a committee of five in each large city where there are members, to report at the next annual meeting on the methods of heating five school buildings.

THURSDAY AFTERNOON.

On opening the afternoon session C. Wadsworth read a paper by D. M. Nesbitt on "English Practice in the Warming and Ventilation of Technical and Art Schools," which was discussed in part as follows:

S. A. Jellett: The method of ventilating chemical laboratories as described has been of special interest to me, as it is a very difficult task.

Professor Carpenter: I am very much pleased with the paper and the presentation of a typical system. I should prefer, however, a forced blast system under the same conditions. The conditions of use in our college buildings is very different from the conditions presented in the paper. Our rooms are used for a much shorter period of time, probably averaging less than two hours.

S. A. Jellett: To get an even temperature in some rooms, to let the warm air in and ventilate on the same side of the room, is not sufficient without the use of direct radiation on the cold side.

H. J. Barron: The system discussed is too expensive, and for that reason is not up to the needs of the times. The English engineer prefers the brick ducts, because it is taken from his bill of cost.

On motion of W. F. Wolfe a vote of thanks was given to the author of the paper.

A paper by B. H. Carpenter was then read on "Heating and Ventilating Church and Parish Buildings by Forced Draft," and was discussed as follows:

George I. Rockwood: This is a cleverly designed plant for the conditions to be met. I think that as a rule the heating in a church is liable to be overdone, while the ventilation is, as a rule, very much underdone.

R. M. Geddes: I have visited the church in question, and its construction was of such a nature as to require two fans to get the best results, the exhaust fan giving a more positive control of the ventilation than could be had without it.

Following this discussion, S. A. Jellett, reporting for the Uniform Contract Committee, said that it had met with a committee from the National Association of Master Steam and Hot Water Fitters and that they had agreed that three contracts be prepared, one from the steam fitters' standpoint, one from the engineers', and another from the consumers' point of view, these contracts to be presented at another meeting and a final agreement reached on a contract to be submitted to the National Institute of Architects.

Ex-President Mackay then introduced the president, W. F. Wolfe, to the society, who asked the support of the members in building it up to the high standard that was required in the field in which it was working, as the importance of its work was becoming more urgent.

Topical discussion was then taken up, after which the president announced the following committees for the year:

COMMITTEES 1898-99.

Compulsory Legislation.

B. H. Carpenter, Wilkes-Barre, Pa.
N. P. Andrus, New York.
George H. Mehring.
T. B. Cryer.
Andrew Harvey.

Uniform Contracts and Specifications.

D. M. Quay, Chicago, Ill.
A. E. Kenrick, Brookline, Mass.
H. D. Crane, Cincinnati, Ohio.
J. J. Blackmore, New York.
A. C. Mott, Philadelphia.

Standards.

J. H. Kinealy.
H. J. Barron.
Wm. McMannis.

Tests.

A. A. Cary, New York.
B. F. Stangland, New York.
Henry Adams, Washington, D. C.

Nominations.

Wm. M. Mackay, New York.
R. C. Clarkson, Philadelphia.
John A. Fish, Boston, Mass.
Chas. M. Wilkes, Chicago, Ill.
Andrew Harvey, Detroit, Mich.

On carrying the motion to adjourn *sine die* another annual meeting of the society closed, having again given demonstration of its usefulness in the free exchange of valuable expert knowledge, and having awakened increased interest in its work. The meeting was attended by a large number of members and a larger number of guests, among whom were two from foreign countries.

At a meeting held on January 26 in New York City of the National Founders' Association, called to perfect a defense association, the following officers were elected: President, W. H. Pfahler of Abram Cox Stove Company, Philadelphia; vice-president, C. L. Newcomb of Deane Steam Pump Company; treasurer, W. H. Wells; secretary, John A. Penton of Detroit, Mich.

The Richard Thomas Brass Foundry Company have been organized, at Anderson, Ind., by Richard Thomas, T. J. Morgan and Alexander Jones.

HEATING AND PLUMBING.

A New Type of Hot Blast Radiator.*

BY GEORGE I. ROCKWOOD, WORCESTER, MASS.

The type of radiator which I am about to describe, and which is fully illustrated in the drawings accompanying this paper, is the outcome of my efforts to design a wind surface condenser on correct principles. My idea was to have this pipe condenser serve as a tempering coil in a large factory building and at the same time give the engine the benefit of as nearly perfect a vacuum as would be possible with such a condenser for the sake of economy of steam and to enable the engine to do as much work in the summer time as it did in the winter. I expected to use water instead of air to condense the steam in the summer. Before this tempering coil had been designed or built a large hot blast heater had been contracted for, set up, and put at work heating the building. This heater was like hundreds of others which the company had built before and which had given satisfaction to their owners. Therefore I had no thought of questioning the correctness of the principle upon which it had been designed. It was in two divisions, each consisting of nine sections, with 80 1-inch pipes in a section, each 8 feet long. In the contract it was agreed that exhaust steam was to be the heating agent, and that, working in conjunction with the tempering coil, it should successfully heat the building under certain extreme conditions of cold weather. In one sense the terms of the contract have been fulfilled, as the building is nicely heated under those conditions with exhaust steam.

Previous to the time when the heater was at work it was my intention to make the tempering coil just like it. On reflection, however, and after observing carefully how the heater behaved, it became evident that, to be a success as a condenser, the tempering coil would have to be dripped differently. The air pump would short circuit the steam through some one of the sections by causing it to pass up two or three risers and over to the drip system, leaving the other sections full of air and vapor. It was also plain that the steam must be so admitted to the condenser as to drive the air ahead of it in a positive manner. Making the steam connections to the different sections in series instead of in multiple would satisfy this condition, as the steam would then have to go through each and every section before it could appear at the vapor pipe leading to the air pump.

The most difficult problem, however, was to remove the water of condensation from each section without at the same time providing a path through which the steam could go with it to interfere with the steady action of the pump as soon as it should get there. The water could not be trapped satisfactorily from a vacuum. Neither would it be best to connect it from base to base, as this might bring about both a short circuit and a water hammer. A separate pump might be used into which all the drips might connect through siphons. This thought pointed to the solution of the difficulty; for by siphoning the several drips to the final section and making the drip pipe of this section quite large, to exhaust quickly the air driven ahead by the entering steam, a nearly perfect forced circulation is combined with a practical method of getting rid of the water of condensation. This plan was followed in the construction of the tempering coil, which contained about 1400 square feet of heating surface. It has been in place now about two winters, and has abundantly demonstrated its superiority to the much larger heater of standard make located by its side.

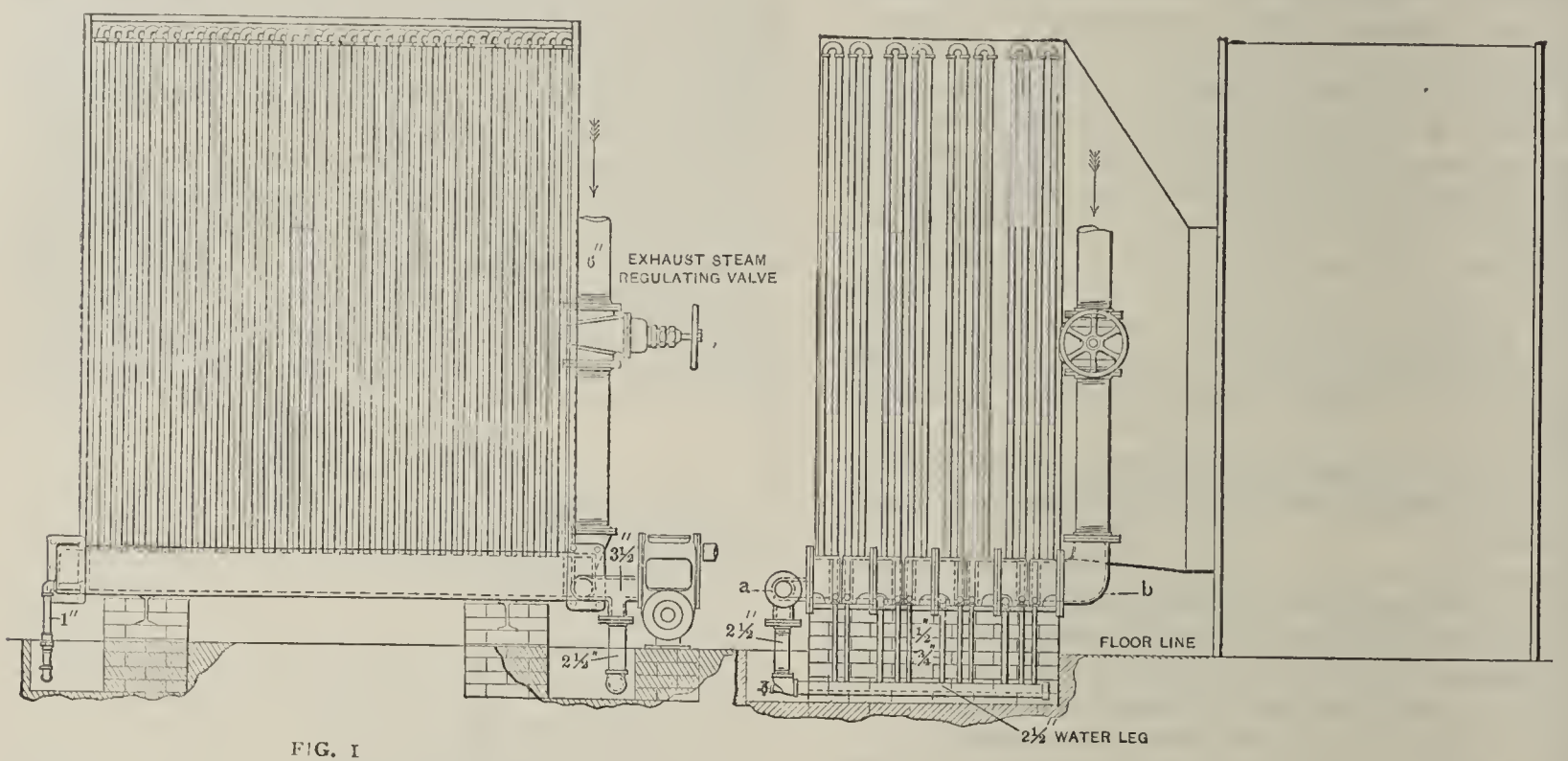
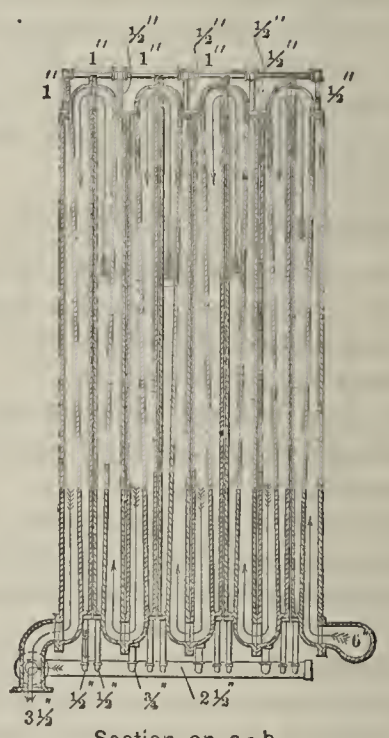


FIG. 1

FIG. 2

Description of Radiator.—In the engravings Fig. 1 is a front elevation of the radiator and air pump. Fig. 2 is a side elevation of the radiator and fan. A portion of the sheet iron housing of the radiator is removed in this view to show the risers. Fig. 3 is a sectional plan view of the cast iron bases at *a b*. The arrows show the course of the steam in passing from one section to another. The slanting partition divides the set of risers in a section from the returns in that section. Thus it is clear that the only path the steam can take, to get from one section to the next, is to ascend the risers and return through the return pipes; then it passes around the ends of two adjacent sec-



Section on a-b

FIG. 3

* Part of paper read at the New York meeting of the American Society of Heating and Ventilating Engineers, January 25-27, 1898.

tions. The drips are clearly shown in this view, also in Fig. 4, which is a plan of heater, air pump and fan. The sheet iron housing belonging on the top of the risers is, in this view, omitted to show them better.

One of the advantages of constructing a radiator in the way here shown is that one large valve takes the place of many smaller ones as a regulator of the amount of heat admitted to the entire radiator. This valve may be regulated automatically to maintain the temperature of the room at a constant point, thereby permitting the speed of the fan to remain constant and thus give at all times the required degree of ventilation. This is a point which deserves emphasis. There are school rooms in which the air is foul, notwithstanding the fact that there is sufficient fan capacity in the ventilating system, the cause being simply that the temperature of the room is varied by varying the speed of the fan instead of the amount of heat admitted to the heater. Another advantage is that no matter how much or how little steam is admitted to the radiator, the heating effect extends entirely across the radiator. One section cannot be heated at all until the section behind it is entirely heated.

So far as I know, this type of heater suffers from but one disadvantage, which is not theoretical, but is commercial in its nature. In order to provide enough pipe capacity, if I may so describe it, or cross sectional area, in the bases, they must be over twice the depth ordinarily allowed these castings. That is to say, the entire body of steam must pass through the first base; what is not condensed in that section must pass through the second, and so on. This means that cast iron for these bases will cost twice as much as in an ordinary radiator. On the other hand, however, greater depth of casting in the present type would do it no harm, for the tendency is to make these bases too small to provide room for the steam, water and air to pass each other comfortably. The difficulty has been partially surmounted by slanting the partition dividing each section in the manner shown in Fig. 3. If theoretical considerations alone controlled the shape of each section base, then a different depth might be used for every one, the maximum depth being given to the base at which the steam first enters. The cost of pattern making, however, which such a gradation of depths would entail, taken in connection with the advantage to a thorough diffusion which greater depth than is absolutely necessary would give, prohibits such a design. It will be obvious from an inspection of the drawings that each base is exactly like every other in all respects except that half are rights and the other half are lefts. One pattern and one core box are enough to mold either a right or a left, by simply drilling the 1-inch pipe holes on one side of the casting for one kind and on the other side for the other kind.

The specific points of superiority of this heater over the ordinary, or multiple supply, heater are four in number:

1. The impossibility of air binding.
2. The simplicity of the means for regulating the supply of steam.
3. The uniformity with which the pipes in any section are heated.
4. The perfection of the method of dripping the sections, which occurs without noise or waste of steam.

In conclusion I will restate that the new type of radiator shown is chiefly advantageous to use with steam of low or atmospheric pressure and that this is chiefly due to the fact that the different sections are connected together in series instead of in multiple. In other words, the radiator is designed to really produce a forced circulation of steam, instead of a circulation which may or may not take place, according as circumstances favor or disfavor the free passage of the air out of drip pipes.

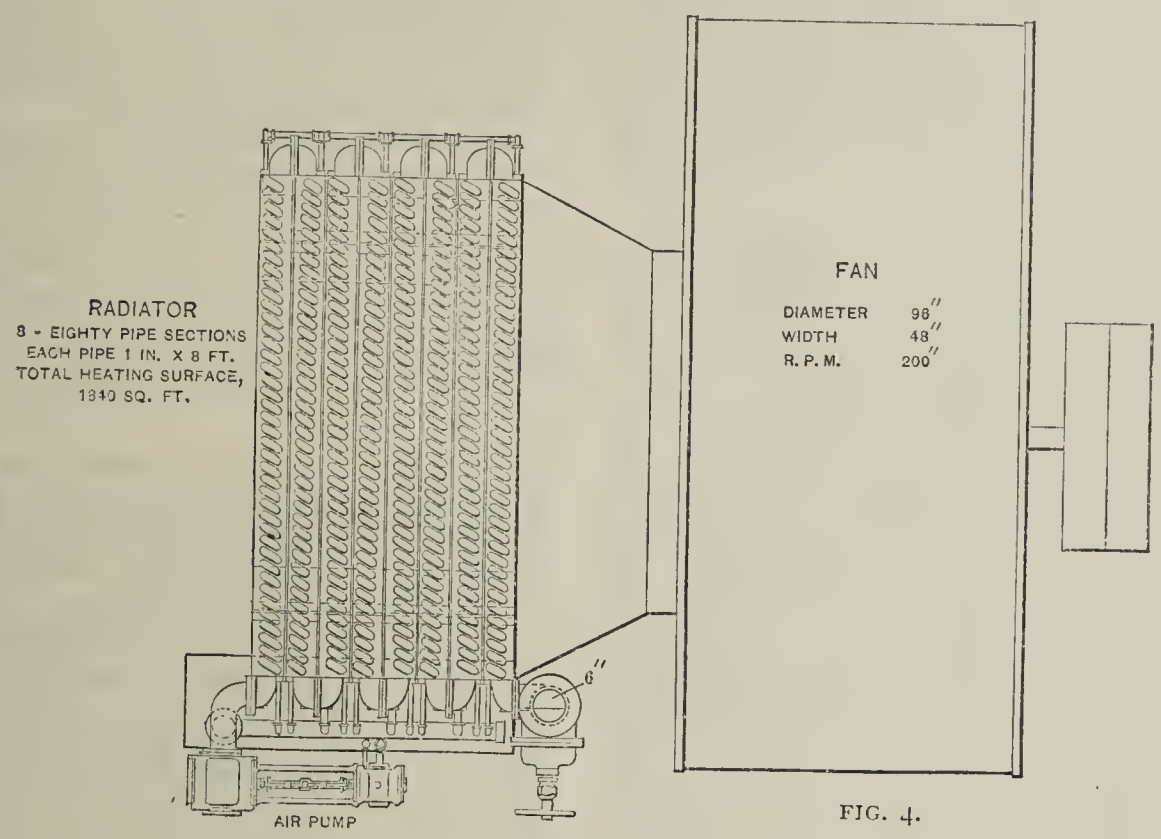


FIG. 4.

District of Columbia Plumbing Regulations.

The District Commissioners have transmitted to Congress the draft of a bill regulating plumbing and gas fitting in the District of Columbia. The bill, as drafted by the Commissioners, authorizes them to appoint a plumbing board, to be composed of two master plumbers, one journeyman plumber competent to be licensed as master plumber, and two employees of the District having a knowledge of plumbing, gas fitting and sanitary work, at a salary of $300 per annum, payable monthly. The board, in addition to duties assigned it by the Commissioners, shall examine all applicants for license as master plumbers or gas fitters. The age of applicants must not be under 21 years, and a license fee of $3 is fixed. It shall be unlawful for any person to engage in the work of plumbing or gas fitting in the District unless he is licensed or is an employee of a licensed master plumber, and it is also made unlawful for owners or lessees to knowingly employ unlicensed plumbers, and, further, to cut or trench in any highway, reservation or public space without a permit from the Commissioners. For violations of the provisions of the act a penalty of not less than $5 or more than $100 is fixed, with the usual provision for default.

Grand Rapids Master Plumbers.

At a meeting of the Master Plumbers' Association of Grand Rapids, Mich., held January 20, the following officers for the year 1898 were elected:

President, G. A. Richards.
Vice-President, George Thompson.
Secretary, W. C. Weatherby.
Treasurer, William Robertson.
Sergeant-at Arms, B. Powers.
Delegates to the State Convention: George Thompson, William Robertson, C. A. Scheufler.

The Standard Steam Specialty Company, 83 Centre street, New York City, issue a pamphlet on Governors. The title page informs the reader that he cannot name the Governors of five States that are chosen. It goes on to say that he does not even know the name of the best Governor, but will discover it if he will follow out the leading of the pamphlet. The next two pages give the names of the Governors of the different States, the parties they represent and the dates of the commencement and expiration of their terms. The real interest of the pamphlet, however, as an advertising medium lies in the pages that follow, and which call attention to the Standard Utility Pump Governor and Midget Pump Governor made by the Standard Steam Specialty Company.

The Effect of the Hights of Walls on the Amounts of Heat Transmitted Through Them.*

BY J. H. KINEALY, ST. LOUIS, MO.

It is known, as a result of experiment, that the heat which passes per hour through a wall separating a hot fluid from a cool one can be expressed by the equation

$$Q = k\ (t_1 - t_2)\ S$$

in which Q is the quantity of heat, in heat units, transferred per hour from the hot to the cool fluid; k is a factor whose value depends upon a consideration that will be discussed later; t_1 is the temperature of the hot fluid; t_2 is the temperature of the cool fluid and S is the area in square feet of the surfaces of the wall in contact with the hot and cool fluids.

The experiments of Peclet and others have shown that the value of k depends upon the nature of the hot and cold fluids; upon the separating wall, the nature of its surface, the materials of which it is made, its thickness and its figure; and somewhat upon the difference $t_1 - t_2$. The value of k depends upon two things—the loss of heat by radiation, and the loss by direct contact. The loss by radiation depends upon the temperature, t_2, of the surrounding bodies, and the loss by direct contact depends upon the temperature of the air in direct contact with the separating wall, which may be higher or lower than the temperature of the surrounding bodies. The greater the difference between the temperature of the warm fluid and that of the cool air in direct contact with the separating wall the greater will be the loss by direct contact and the greater will be k for a given value of t_2 ; and the less this difference the less will be the loss by direct contact and the less will be k.

Peclet made a great many experiments from which to determine the value of k. Most of his experiments were made with steam or hot water as the hot fluid and air as the cool fluid. When steam was used the temperature t was uniform throughout the hot fluid, as it depended simply upon the pressure of the steam; and when water was used it was kept agitated, so that it would have as nearly as possible a uniform temperature throughout. The temperature, t_2, of the cool air surrounding the radiator containing the steam or hot water was measured at some distance from the radiator and not directly at the surface of the radiator. As a result of his experiments Peclet found that, for the same value of t_1 and t_2, k was less for a high wall than for a low one of exactly the same material and thickness. The explanation for this is that as the air in contact with the separating wall is heated it rises along the surface of the wall, and as it rises it continues to be heated until finally, when it reaches the top of the wall, it is much hotter than it was when it was at the bottom of the wall. The higher the wall the higher will be the temperature of the air when it reaches the top, and, therefore, the higher will be the average temperature of the air in contact with the surface of the wall. The higher the average temperature of this air the less will be the average difference between its temperature and that of the steam; and therefore the less will be the amount of heat lost by direct contact of the air and the less will be the value of k.

The conclusions arrived at by Peclet through his experiments are corroborated by experience. It is well known that the air leaves a high radiator at a higher temperature than it does a lower one, when both are supplied with steam at the same pressure, and that a high radiator loses less heat per hour per square foot of surface than a lower one.

I find that many French, English and American writers, reasoning, apparently, from the results of Peclet's experiments and from experience with radiators, say that the value of k for a high wall or window of a building will be less than for a lower one of the same kind and thickness. Some writers make the deliberate statement that a high wall or window will transmit less heat from a room, with given inside and outside temperatures, than a lower one of the same kind, area and thickness. This, I contend, cannot be true, as it is based upon an assumption of conditions that are never realized in practice.

The air on the outside of a wall or window of a heated room is of almost a uniform temperature. It is hardly probable that, on a cold day, when the wind is blowing, there is any appreciable current of warm air rising along the outside of the wall or window of a heated building. I have never been able to detect such a current on a cold day; and yet such a current of warm air is supposed to exist by many writers.

The temperature of the air inside of a heated room is not uniform at different hights from the floor, but is least near the floor and gradually increases toward the ceiling, where it is greatest. So far I have been unable to establish any law for this increase. It depends upon the outside and inside temperatures and upon the method of heating. It is greater in cold weather than in mild weather, and is greater for a hot air system than for direct steam or hot water radiation. It may depend also upon the part of the room at which the temperatures are measured That the air near the ceiling of a heated room is much hotter than that near the floor is well known to all who have had occasion to stand on a step ladder in a warm room. Hence the conditions that actually prevail in a heated room are:

A uniform temperature of the air on the outside of the wall and a gradually increasing temperature from the floor to the ceiling of the air on the inside. And for a temperature of about 70 degrees 4 or 5 feet from the floor the average temperature of the air inside of the room increases as the hight of the wall is increased. Therefore, the higher the wall or window surfaces of a room the greater will be the amount of heat lost per hour through them, and the greater must be the value of k used in the formula for calculating the heat lost.

German engineers, as a rule, increase the calculated heat loss for rooms whose exposed walls are higher than 12 or 13 feet by an amount which depends upon the hight of the walls.

J. H. Klinger, in his pocket book for heating engineers, advises that the calculated heat loss of a room be increased by 3 per cent. of itself when the walls are between 13 and 14½ feet high; by 6.5 per cent. when they are between 14½ and 18 feet high, and by 10 per cent. when they are higher than 18 feet.

H. Recknagel, in his pocket book for heating engineers, advises that the calculated heat loss of a room be increased by 10 per cent. of itself when the walls of the room are more than 13 feet high.

H. Rietschel, in his treatise on heating and ventilating, calculates the temperature of the air at the ceilings of rooms, when their hights exceed 13 feet, by the formula

$$t_1 = t + 0.03\ (h - 13)\ t.$$

t_1 is the temperature of the air at the ceiling; t is the temperature of the air about 5 feet from the floor, or head high, as Rietschel says, and h is the hight of the room from the floor to the ceiling.

He takes the average temperature of the air in the room as

$$\frac{t_1 + t}{2} = t + 0.015\ (h - 13)\ t.$$

If the hight of the room is less than 13 feet he takes the temperature at head high from the floor as the average temperature. The temperature t_1 must never be taken as greater than 1.5 t.

Rietschel uses the average temperature of the air in the room when calculating his heat loss. The writer has found that the increase of temperature of the air in a heated room varies from ½ to 2 degrees for each foot of hight above the floor, and that for rooms whose hights are about 12 feet the average temperature of the air may be taken as equal to the temperature measured 4.5 or 5 feet from the floor. When a room is heated by hot air it is probably safe to say that when the temperature of the air in the room is 70 degrees 5 feet above the floor the temperature at a distance h from the floor is about $65 + h$. If h is taken as the hight of the ceiling above the floor, the average temperature between the floor and the ceiling is about $65 + \frac{h}{2}$.

For work in connection with ordinary dwellings or schools it makes very little difference whether a high wall or window transmits more or less heat per hour than a lower one of the same kind and thickness, as the walls of the rooms are usually not much higher than 12 feet, and the average temperature of the air is about the same as the temperature observed about 4.5 or 5 feet above the floor. But for work in connection with churches and other buildings in which the hights of the rooms are quite great it becomes important to know whether the heat loss of a high wall is or is not different from that of a lower wall of the same kind, area and thickness; and if the heat loss is not the same for the high as for the lower wall, it is of the utmost importance to know whether it is smaller or greater.

Writers on heating seem to have divided themselves into two classes: those who consider that the high wall transmits less heat and those who consider that the high wall transmits more heat. I am inclined to think that the second class is the smaller, yet I am sure that their view of the matter is the correct one; the high wall transmits more heat than the lower one.

My attention was first called to the different opinions of engineers on this matter by the editor of one of our weeklies running his blue pencil through an article I had written, in which I stated that the heat loss of a high wall is greater than that of a lower one of the same kind, area and thickness. As you all know, an editor, armed with a blue pencil may be an exceedingly inconvenient opponent, but I had the temerity to try to convince him that I was right, and finally succeeded in having the blue pencil mark erased.

If now I have succeeded in convincing the members of the society that my position in the matter is the correct one, this paper will have accomplished its object.

*Read at the New York meeting of the American Society of Heating and Ventilating Engineers, January 25-27, 1898.

Proposed Ventilation Law for New York.

A standing committee of the American Society of Heating and Ventilating Engineers devotes its labors to securing the enactment of laws to provide for the proper ventilation of buildings. We give below a bill which has been prepared by this committee which has been introduced into the Legislature of New York State by Senator Wray of Brooklyn, and which the committee are now endeavoring to have made law. They solicit the aid of all who are interested in good ventilation by having them explain the objects to Senators and Assemblymen in their locality. The bill is now before the Judiciary Committee and in order for the third reading:

AN ACT

To provide for proper sanitation, ventilation and protection from fire of schoolhouses and other public buildings.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Every schoolhouse and other public building hereafter erected in a city or incorporated village within this State shall be provided with proper means for ventilation in such manner that there shall be at all times a sufficient supply of pure air therein; shall be provided with a reasonably sufficient number of proper water closets, earth closets or privies for the use of persons occupying or admitted to such schoolhouse or building; and shall be kept clean and free from all noxious smells and gases arising from any drain, privy or other nuisance.

SEC. 2. No wooden flue or air duct for ventilation or heating purposes shall be placed in any schoolhouse or other public building; and no pipe for conveying hot air or steam in any such building shall be placed nearer to any wood work therein than one inch, unless such pipe shall be properly protected by suitable guards or casing of incombustible material.

SEC. 3. Before the erection, construction, alteration or repair of any schoolhouse or other public building is commenced, the person or persons or corporation owning the same shall submit a detailed statement in writing of the specifications and a full and complete copy of the plans of such proposed building, erection, construction, alteration or repair, which shall be accompanied by his, their or its sworn statement in writing setting out in full the provisions contained in such plans and specifications for the sanitation, ventilation and protection from fire of such schoolhouse or other public building as provided by this act. Such detailed statement, specifications and copy plans shall be submitted to and filed with the Health Board or other officer or officers having like jurisdiction within an incorporated city where such schoolhouse or other public building is about to be erected, and in all other places, including any city having no officer or officers exercising jurisdiction as a board of health or health officer, such detailed statement, specifications and copy plans shall be submitted to and filed with the State Board of Health. No such schoolhouse or other public building shall be erected, constructed, altered or repaired until such specifications and plans shall be approved in writing by the Board of Health or officer exercising jurisdiction thereof, to whom such plans shall be submitted as required by this act. The sanitation, ventilation and protection from fire of every such schoolhouse and other public building as provided by this act shall be subject to the inspection of such Board of Health or other officer exercising like jurisdiction during the progress of such erection, construction, alteration or repair by its or his agents or servants, and shall conform in all things to the reasonable requirements of such Board of Health or other officer exercising like jurisdiction.

SEC. 4. The word "schoolhouse," as used in this act, shall be taken and deemed to mean any building in which public or private instruction shall be given to not less than ten pupils at one time; and the words "public building," as used in this act, shall be taken and deemed to mean any building or premises used as a place of public entertainment, instruction, resort or assemblage, or for the purpose of transacting public business of any kind or nature whatsoever where there shall be more than ten persons in any such building at any one time. Provided, however, that this act shall apply only to cities and incorporated villages.

SEC. 5. Any violation of this act or failure to comply with its provisions by any school committee, public officer, corporation or other person whatsoever, shall be a misdemeanor.

SEC. 6. This act shall take effect immediately.

The plumbing firm of Albee & Babbitt, Bellows Falls, Vt., consisting of George B. Albee and Frederick H. Babbitt, have dissolved partnership. Mr. Albee bought out his partner's interest and will continue the business.

Some Experiments in Steam Circulation.*

BY JOHN GORMLY, PHILADELPHIA, PA.

Having occasion recently to locate a steam boiler of the pattern usually designated a saddle boiler, with a fire 12 x 16 inches, and a maximum rated capacity of 150 square feet of radiation, tapped 2½ inches on the top for a steam pipe, I attached to it 120 square feet of steam radiation. The mains, not being covered, would run the radiation up to 150 square feet. Of this amount 25 feet were on the third floor, 45 feet on the second floor and 50 feet on the first floor. The boiler was located in the basement in such manner that in no case was there more than 12 feet of a horizontal run. The pipes were graded with a fall of 1 inch in 10 feet. I connected all the radiators on the single pipe system, the condensation being returned through the feed pipe of each radiator. I placed on each radiator an automatic air valve with a hard rubber pencil, the expansion of which closed the valve when heated. All radiators containing above 25 square feet of surface had 1¼-inch connection; all below that size had 1-inch pipe. So far I followed customary practice, but I could not refrain from experimenting on so small a plant, because the cost would be little and a demonstration would be as effective as one on a more expensive apparatus. I therefore graded the pipes so that the rise was from the boiler to the radiators, placing no drip or relief pipes on the job. The water of condensation necessarily ran in a contrary direction to that in which the steam traveled. There was no other connection between the bottom and the top of the boiler than a 1¼-inch pipe, to the side of which the water column and gauge glass were attached. The boiler was connected to an excellent flue. On firing up the water remained in the water glass until ½ pound was registered on the gauge. At that pressure the water disappeared down the water glass with a steady motion and so swiftly that in 10 seconds it was out of sight. I then opened the fire door. The water returned as swiftly as it had gone. I repeated this experiment several times, the disappearance and return of the water occurring each time. Had I been experimenting to discover a pump to throw water to the upper floors with ½-pound pressure this apparatus would have been a success. I then tried to determine the effect of placing ¾-inch drip pipes at the foot of all the vertical risers, of which there were three. These drip pipes were carried separately to the base of the boiler and there attached to it. On again firing I was somewhat surprised to discover that I had made no change in the working of the apparatus, unless it was to accelerate the disappearance of the water. I then assumed that the automatic air valves could be blamed for part of the effect, the loose hard rubber stems of the valves slipping over the passage from the valves into the radiators and acting as a check to the admission of air when a partial vacuum was in the radiators. I then replaced the automatic valves with others having no rubber pencil, but operating with a metallic bar which, by expansion and contraction, opened and closed the valves. These were positive in action, and could not be closed unless the radiator was filled with steam. On firing up again I had the same result as at first, which was a surprise.

I now looked to the boiler for the cause of this peculiar action. I noticed that when the water line of the glass was out of sight there was always a steady stream of water, very small, but yet very perceptible, running spirally down the glass on the inside. I decided to tap the two main steam branches close to the boiler and directly above it, in such a manner that any water running along the bottom of the mains would be intercepted. It was also intended that this pipe should act as an equalizing pipe. It was made large and the base of it tapped into the bottom of the boiler. When again fired up it was found that a steady water line was maintained. The plant has now been running steadily for two months. It gives entire satisfaction.

I have concluded that in this instance the form of the boiler was the cause of the peculiar action of the water. The boiler had probably not more than 1 inch of water surrounding the fire box. There was no local circulation possible in the boiler as it came from the makers. I believe all boilers should have a good circulation of the water contained in them, and that a steam boiler should contain much more water within itself than a water boiler. I wish to call special attention to the fact that in this experiment all the radiators, even to the third floor were filled to the line of the automatic valves with water As the third-floor radiator was about 30 feet above the boiler, and as we had but ½ pound of steam on the plant, I should like to have the views of our members as to the cause of water being forced to that hight.

As the automatic valves were open and could not be closed while they were cold, it was not a vacuum that held the water in the radiators; but what did hold the water there? Personally, I incline to the view that the pipes and radiators were filled with globules or bubbles of

* Read at the New York meeting of the American Society of Heating and Ventilating Engineers, January 25-27, 1898.

water and steam alternating with each other in much the same manner that water is pumped by the Pohlé pump, except that in the Pohlé system air is used instead of steam. I believe these globules or bubbles would be materially assisted in their formation by the oil left in all pipes by the fitters. On mentioning the peculiar action of this job to a friend he assured me that with the same make of boiler a vertical line of single pipe to three floors had acted in much the same manner with him, but in his case the lower radiator was hot and the radiators on the second and third floors remained cold and were partially filled with water. He remedied the trouble by tapping the boiler both at the water line and at the base, then connecting the two taps with a 2-inch pipe. This settled the trouble. His water line was a disappearing one before he made the connection on the boiler which I have described.

The Chicago Plumbers' Ball.

The Chicago Master Plumbers' Association enjoyed their annual reception and ball on Tuesday evening, 25th inst. The festivities were held in Medinah Temple, one of the finest places in Chicago for an occasion of this kind. The day had been one of the worst in years, with a heavy snow fall and every indication of its continuing in the evening. But despite the difficulty experienced in traveling a very large attendance gratified the managers and the members. Had the weather been pleasant the hall would have been much too small. Paul Redieske was chairman of the Arrangement Committee, with the following colleagues: P. M. Murphy, C. C. Breyer, F. P. Schuster, C. J. Herbert, J. R. Alcock, E. Hackett, Robt. Griffith, J. J. Doyle, D. J. Rock, T. P. Culloton, Sam'l Smith, J. O. Sawkins and J. J. Clark.

Chairman Redieske opened the proceedings with an address of welcome, and presented a short but very acceptable entertainment, consisting of musical selections by Miss Edna Good, the gifted ten year old daughter of Samuel Good, a member of the association; songs by John Fruin, also a member of the association, and E. H. O'Brien, a friend of Mr. Fruin; amusing tricks by a professor of legerdemain, &c. In behalf of the association President J. J. Wade presented the retiring president, Thomas Conlin, with a gold emblem set with a diamond. Both gentlemen made happy speeches which were received with enthusiasm. Dr. Arthur R. Reynolds, commissioner of the city Health Department, being present was called upon for some remarks and responded with sentiments showing his hearty sympathy with the efforts of the plumbers to improve sanitation. The dancing programme occupied the remainder of the evening, and probably a portion of the following day.

Quite a number of visitors were present from other cities and from considerable distances. Among them were Samuel L. Malcolm of New York, vice-president of the National Association; John Hickman of Paterson, N. J., member of the National Executive Committee; W. E. Goodman of Milwaukee, treasurer of the National Association; Charles Polacheck of Milwaukee, Hubert Kelly of Minneapolis, James Johnson of Denver, M. J. Ward of St. Louis, Thomas Davis of Rock Island, R. J. Shand of Rockford, J. J. Hanighen of Omaha and Mr. Bellamy of Bellamy & Hornung, Omaha, who is universally believed among his friends and acquaintances to be the real author of "Looking Backward."

Single Pipe Low Pressure Steam Heating Systems.*

BY MARK DEAN, BOSTON, MASS.

Single pipe systems for low pressure steam heating may be divided into three general classes, each with variations—the uphill system, the drip system, and the circuit system. Believing the latter to be the best, it will be the one discussed in this paper. But, regardless of the system adopted or rules given, the heating engineer must employ active common sense in order to meet the requirements of each individual case. I do not mean to depreciate the value of rules and formulæ; on the contrary, I believe they are necessary, but on account of varying conditions it is impractical to make a rule that will cover all cases. The statements made and the formulæ given in this paper are based on ordinary conditions—the average building as we find it to-day supplied with commercial cast iron direct radiators and heated to 70 degrees F., with an outside temperature of zero.

As the size of the pipe depends upon the work it is to do, we must know the size and location of each radiator, because from the total condensing power we get the size of the main steam pipe, and the size of each branch is also computed from the amount of radiation it is to supply.

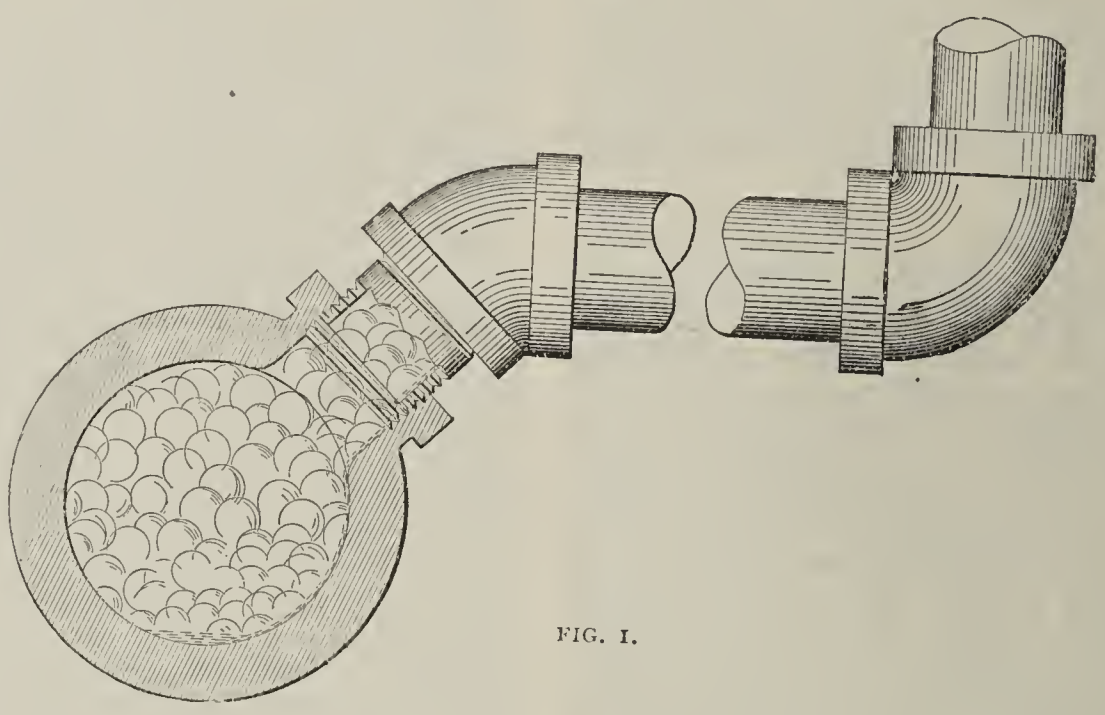


FIG. I.

The requirements of the steam main are threefold; it must be large enough to carry, at low pressure, sufficient steam to supply the total radiation, carry the condensation, and maintain at its extreme end a pressure equal to the initial pressure at the boiler. To find the size of pipe capable of fulfilling the above requirements divide the number of square feet of radiation to be supplied by 100, extract the square root of the quotient, and the answer will represent in inches the diameter of supply pipe. Thus:

$$\sqrt{\frac{R}{100}} = D,$$

in which R = the number of square feet of radiation to be supplied and D = the diameter in inches of the main supply pipe.

When the answer is a fraction of a pipe size the next larger size should be used, and pipe smaller than 2 inches diameter should not be used for mains.

BRANCHES.—Requirements of branches differ from those of mains, because the water of condensation returns to the main against the flow of steam. Therefore they not only supply sufficient steam for all radiation attached to them, but must do so without allowing the steam to attain sufficient velocity to impede the flow of the return water. To determine the maximum velocity at which steam may travel in branches having a rise of not less than 1 inch in 4 feet (if they are ever given less, one size larger pipe should be used), multiply the external circumference of the pipe by 1½, and the answer will be the number of lineal feet per second faster than which the steam should not travel. Whenever the branches have

* Read at the New York meeting of the American Society of Heating and Ventilating Engineers, January 25-27, 1898.

an incline in excess of 45 degrees the velocity may be increased to double the external circumference of the pipe, dropping all fractions from the answer, which will be the maximum number of lineal feet of steam travel per second.

To ascertain how much radiation any branch pipe will supply at velocities given above use the following formula :

$$\frac{V}{L} = C. \quad C \frac{0.0387}{0.00007} = R,$$

in which V = the velocity of the steam per second,
L = the length of pipe containing 1 cubic foot,
C = the number of cubic feet of steam delivered per second to radiator, and
R = the number of square feet of radiation supplied.

The following table, giving the size of pipes, velocity of steam and amount of radiation supplied, differs somewhat from general practice in the amount of radiation supplied by some pipes, but I believe it to be correct :

Table A.

Size of pipe.	External circumference of pipe.	For pipes having an incline of not less than 1 inch in 4 feet.		For pipes having an incline of not less than 45 degrees.	
		Velocity in feet per second.	Square feet radiation pipe will supply.	Velocity in feet per second.	Square feet radiation pipe will supply.
¾	3.299	4.948	10.11	6.598	13.48
1	4.131	6.196	20.51	8.262	25.88
1¼	5.215	7.822	44.89	10.43	59.16
1½	5.969	8.953	70.04	11.938	93.37
2	7.461	11.191	144.18	14.822	191.09
2½	9.032	13.548	248.67	18.064	332.26
3	10.996	16.494	467.64	21.992	623.07

When the temperature to be maintained is less than 70 degrees deduct from the amount of radiation to be supplied by mains or branches as given herein 1½ per cent. for each degree drop in temperature.

After having ascertained the size of mains and branches they should be located on the plan, beginning at the boiler with the main supply pipe, which should rise immediately to its highest point, whence it should have a gradual descent of not less than ½ inch in 10 feet to its extreme end. If there is a tendency for the expansion to work the pipe toward the boiler the pipe above it should be braced to prevent any movement of it and thereby prevent straining the boiler. On large jobs, and sometimes on small ones, it is desirable to reduce the size of the main pipe. Whenever this is done an eccentric fitting should be used, so as to prevent a water pocket. When calculating the size of main pipe beyond a reducer allow sufficient area for water of condensation from branches already passed, plus sufficient area for steam for all branches yet to be supplied. It is not advisable on small jobs to reduce the size of main pipe, except in special cases. All mains should be carried at least 2 feet beyond the last branch, where they should empty into a return pipe through a drop connection, so as to leave no water in the pipe. From this connection the return pipe should be extended to the boiler above the water line and there dropped down to return opening in boiler. There should be a combination (for either steam or water) automatic air valve on end of return pipe above water line. Whenever conditions prevent placing the return pipe overhead it may be run below the water line. The return should always have a drain cock at its lowest point. For returns 1-inch pipe should be used on jobs having 500 or less square feet of radiation. Increase the pipe size ¼ inch for each additional 1000 square feet of radiation or fraction thereof. The mistake of making the main too small and the return too large is very common.

Branches may be taken off the main from the top, side or any angle between the top and side. The best connection is made by turning the tee about 45 degrees upward into a close nipple, 45-degree bend, and branch pipe, as shown in Fig. 1. It will be observed that this style of connection takes the steam from near the top of main and returns the water to the bottom. By using a pitch ell at the bottom of riser this connection will give the desired grade to branch pipes, allow the riser to stand plumb, and in conjunction with the 45-degree bend allow for expansion and contraction of the main.

Branch pipes may be reduced in size, as occasion demands, either by a reducing fitting or bushing, preferably the former. The vertical portion of branches, as will be seen by consulting Table A, can often be reduced without injury to the working of the plant. Expansion and contraction of the horizontal portion of the branches is generally too slight to require attention, but when an allowance for it is necessary, it can generally be made by an offset in the pipe. If the radiator is too close to a riser that will expand upward, connect to end of radiator furthest from the riser. Large radiators, the internal connections of which are of less capacity for the amount of radiation they contain than the pipe sizes recommended in Table A, should not be used. I hope the day is not far distant when all large radiators will be put together with large openings between the loops.

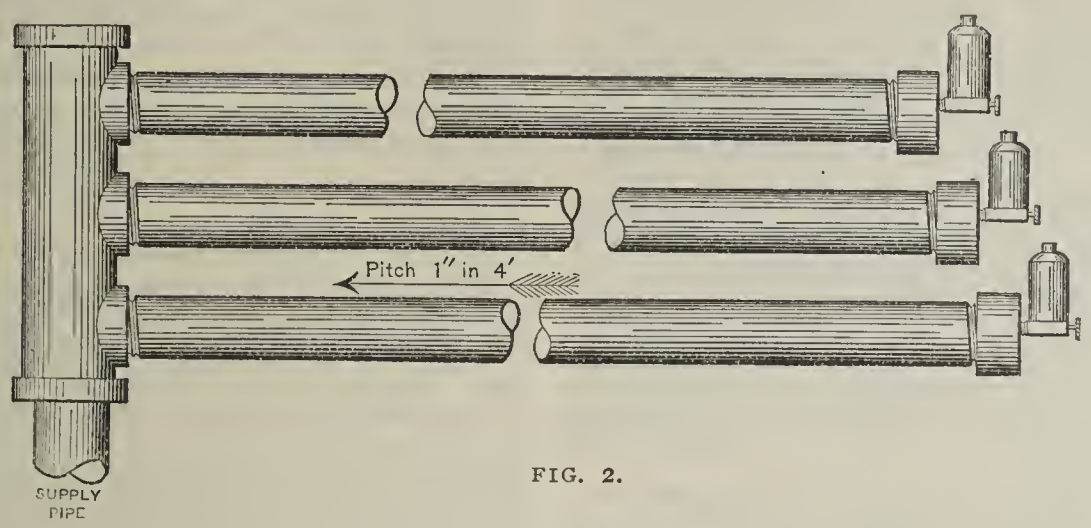
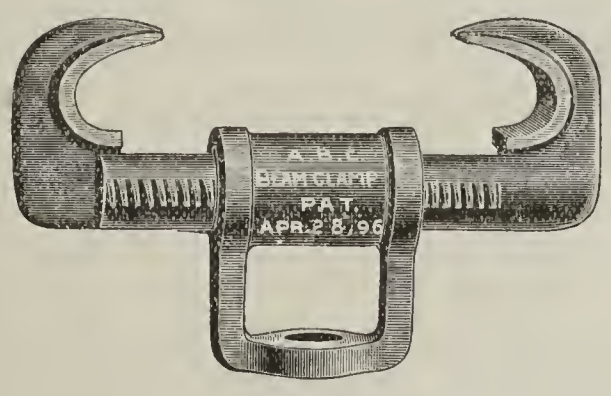


FIG. 2.

If coils are to be used instead of radiators connect them in the manner illustrated in Fig. 2—*i. e.*, single pipe system. It will be noticed that only one header is used. there being an air valve on the end of each pipe. The saving of fittings and labor more than compensates for the extra air valves, which should be of some pattern that can be used either as automatic or straight. The superiority of this arrangement for moderate weather is quite obvious. The writer's experience in low pressure heating leads him to the belief that, after having properly proportioned and graded the pipes, the less complications the better.

The A B C Beam Clamp.

The Illinois Malleable Iron Company, 30 and 32 West Monroe street, Chicago, have placed on the market the A B C beam clamp, made of malleable iron, illustrated herewith. It is very strong and simple. The hooks are held together by the sleeve part of the middle piece, and the hanger supporting the line of pipe is suspended by means of a rod and nuts. The sleeve when turned a quarter allows the clamp to be adjusted, and it is then locked by turning it back to its original position, the teeth of the hook engaging in corresponding slots on the inside of the sleeve. The hooks are sharpened where they extend over the flange of the beam, so that they can be driven under the brick. This clamp will fit beam flanges from 3 to 7 inches wide, and they are made in three sizes, to take rods made of pipe ¼, ⅜ and ½ inch in diameter. Any pipe hangers can thus be connected.



The A B C Beam Clamp.

Proportioning of Circulating Pipes for Steam and Hot Water Heating Systems.*

BY J. J. BLACKMORE, NEW YORK.

The art of supplying artificial heat for buildings by means of hot water and steam has made rapid progress during the past 30 years, and yet, notwithstanding this undoubted progress, there still remains a good deal of doubt as to the proper method of adjusting the size of flow and return pipes for heating plants of different sizes. Several rules have been formulated to meet this want by engineers, but they all differ materially as to the size needed.

George H. Babcock, in a paper read at the meeting of the American Society of Mechanical Engineers during the year 1885, submitted the rule that : "The diameter of the main steam supply pipe should be equal to one-tenth of the square root of the total amount of radiation in a system." W. J. Baldwin practically uses the same rule in his book on "Steam Heating," though he does not define it in exactly the same way. A. R. Wolff, in the addendum of a little book by W. R. Briggs, Van Nostrand's Science Series, No. 68, offers a rule, that : "The area of the main steam pipe should be equal to 0.375 square inch for each 100 square feet of heating surface, and when live steam is fed to the system a ratio of 0.19 square inch is sufficient." Prof. R. C. Carpenter of Cornell University, in his recent work on "Heating and Ventilating Buildings," gives different ratios, from 0.90 square inch down to 0.225 square inch, based upon the velocity of steam flowing through the pipes at different pressures.

Let us first consider the application of the rule of Mr. Babcock and Mr. Baldwin to four different size plants, one of 400 feet, one of 1000 feet, one of 1600 feet and one of 15,000 feet. For the 400 feet we have a 2 inch pipe, for the 1000 feet a fraction over a 3 inch pipe, for the 1600 feet a 4-inch pipe and for the 15,000 feet a pipe a little over 12 inches in diameter.

Now let us take that of Mr. Wolff of 0.375 square inch of area to each 100 feet of radiation. By this rule we would have a 1½-inch pipe for 400 feet, 2¼-inch for 1000 feet, 2¾-inch pipe for 1600 feet and for the 15,000 feet an 8½-inch pipe.

We will now consider the rule of Professor Carpenter of 0.90 square inch of area in the main for each 100 feet of surface ; this gives a little better than a 2-inch pipe for 400 feet, a 3½-inch pipe for 1000 feet, nearly a 4½-inch pipe for 1600 feet and a 13 inch pipe for the plant containing 15,000 feet.

Comparing the rule of the two gentlemen first named with the rule of Mr. Wolff we find a difference of nearly 100 per cent.; comparing the same two with Professor Carpenter we find a difference of over 12 per cent.; comparing Professor Carpenter with Mr. Wolff there is a difference of 130 per cent., certainly a very wide variation and very puzzling to the novice in the science of heating by steam and hot water.

Professor Carpenter, in the work before referred to, is the only writer who mentions the fact that a different ratio is required for a small plant than for a larger one, and he says it in these words (page 225): "A. R. Wolff gives the following rules for determining the cross sections of area of pipes." Then follows the quotation of Mr. Wolff's rule, upon which he comments: "By consulting the table it will be seen that the constant for area, 0.375, found in column two, corresponds to a velocity in the steam mains of about 62 feet per second, and it is not well suited for use with low pressure steam, or when resistance to flow must be very small." Professor Carpenter here admits that a ratio suitable for a large plant cannot safely be applied to a small one, but he leaves the impression on the mind that the difference is because a pressure of 5 pounds is carried on the large plant and only the pressure of the atmosphere is kept on the small one.

Mr. Wolff does not state that he carries a pressure when using the ratio of 0.375, but he says : "It will be ample to allow a constant of 0.375 square inch, plus, for each 100 feet of heating surface in coils and radiators, 0.375 when exhaust steam is used and 0.19 square inch when live steam is used." This clearly shows that Mr. Wolff set the ratio for atmospheric pressure, or nearly so, as he gives the same for exhaust steam, and further when he uses the ratio 0.19 he does so because with live steam a pressure is carried. This clearly shows that these engineers suggested and used these rules for atmospheric pressure. These gentlemen are all practical engineers and have done and are doing excellent work on the basis of these rules.

A close investigation of the basis for these rules proves them to be correct, provided we allow each one the premises upon which he based his calculations. They all err in allowing it to be supposed that the ratio is a fixed quantity for all sizes when the length and pressure are equal. Errors have been made by following these rules without a proper appreciation of the conditions for which they were provided.

* Read at the New York meeting of the American Society of Heating and Ventilating Engineers, January 25-27, 1898.

For some years the writer has believed that a simple rule could be adopted that would reconcile these differences and establish safe ratios for all sizes of plants. With this end in view various observations have been made on different plants from time to time, as the occasion presented itself to verify the correctness of the rules here presented, and they seem to accord well with the experience of many successful engineers.

Pipes for Steam Heating.—Before we define the proposed rule let us make a calculation of what area is required for supplying 100 square feet of radiation, for this is the basis from which the rule is worked. Each square foot of radiation, when the steam in it is at 212 degrees, will lose about 255 units of heat per hour, hence we have to furnish 25,500 units of heat to supply 100 square feet. As each pound of steam loses 966 units in condensing we would have to supply $\frac{25500}{966} = 26.4$ pounds of steam per hour. Each pound of steam at a temperature of 212 degrees occupies space equal to 26.4 cubic feet ; then, 26.4 × 26 4 = 697 cubic feet of steam per hour, to be supplied to radiators containing 100 feet of surface through a pipe 100 feet long.

We can assume the steam as flowing at a velocity of 25 feet per second, which is about correct for steam at atmospheric pressure under these conditions ; then 697 cubic feet per hour is equivalent to $\frac{697}{60} = 11.616$ per minute, or $\frac{11.616}{60} = 0.196$ cubic foot per second, which is about equal to the capacity of a 1¼-inch pipe. In passing steam at this velocity through 100 feet of pipe a considerable loss is occasioned by friction, which we will put at 25 per cent. There will also be a considerable loss by radiation or condensation of steam, which we will also assume is 25 per cent., and this will be the case even if the pipe is well covered. This would give us an area of 1.83, which is rather more than the capacity of a 1½-inch pipe. This accords well with practical experience, for most engineers recommend never to use a horizontal main less than 1½-inch, and for the conditions here given all the heating men with whom the writer has conferred would not risk less than a 2-inch pipe to heat 100 feet of radiation placed at an average of 100 feet from the boiler.

These results establish a sure basis for a calculation of what can be done with a small pipe, and that the proper ratio of area of main for 100 feet of radiation is nearly 2 inches when calculating for 100 feet only. We will now consider a method of changing this ratio to suit any size pipe of larger diameter. It is well known that a large pipe will deliver much more of a given fluid in proportion to its area than will a small one, supposing that in each case the length and pressure are equal, and that this power increases with the diameter. This being a fact we have only to select some constant and divide the diameter by it to obtain the proper ratio for all sizes.

The writer finds that the ratio of the circumference of a pipe to its diameter, 3.141, is the most suitable, because the friction is due to contact with the inner surfaces of the pipe and it decreases directly as the diameter increases. From this we get the rule : The ratio of main pipe for each 100 feet of radiating surface is equal to the quotient obtained by dividing 3.141 by the diameter of the pipe, and may be expressed as follows : $R = \frac{3.141}{D}$ in which R is the ratio and D the diameter of pipe. Then, to ascertain how much radiation we may safely put on any size pipe, we have this expression : $R = \frac{a}{r} \times 100$, in which R is the amount of radiation, a the area of pipe and r the ratio as found in the former expression. By this rule the following ratios are given for the different size pipes, with the area and quantity of surface each size will supply :

Diameter of pipe, inches.	Ratio for each 100 feet of radiation.	Area of pipe.	Quantity of radiation it will supply.
1¼	2.50	1.227	50
1½	2.10	1.767	84
2	1.57	3.141	200
2½	1.25	4.908	400
3	1.04	7.068	700
3½	0.90	9.621	1,062
4	0.79	12.566	1,590
4½	0.70	15.904	2,272
5	0.63	19.635	3,116
6	0.52	28.274	5,424
7	0.45	38.484	8,552
8	0.40	50.265	12,560
9	0.35	63.617	18,175
10	0.31	78.54	25,336
11	0.285	95.03	33,340
12	0.26	113.09	46,600
13	0.24	132.73	55,300
14	0.22	153.93	70,000
15	0.21	176.71	84,000

The size of return pipe cannot be fixed by any definite law of mathematics, for the reason that the return has to do more than carry back the water of condensation. It must be large enough to equalize the pressure in the system. This can only be determined by practical ex-

perience, and it has been found to be from one-third to one-half the area of the feed pipes.

Pipes for Hot Water Heating.—In arranging circulating pipes for a hot water heating plant the conditions are somewhat different than they are for steam. The friction on the water passing through the pipes is much greater than in the case of steam, but as an offset to this the hot water is not affected so much by the loss of heat, hence the results work out for nearly the same size as for steam, except that in the case of hot water the return pipes must be the same size as the feed, and it is to be understood that the sizes given for hot water include both feed and return.

As in the case of steam, we will take as a basis for our calculation 100 feet of radiation. We will assume that each foot of hot water radiation will lose 175 units of heat per hour when working at a temperature of 185 degrees; then, $175 \times 100 = 17{,}500$ units per hour. with a difference of 10 degrees between the flow and return. This would require 1750 pounds of water to supply the lost heat. At 8 25 pounds of water to the gallon this represents 212 gallons per hour, requiring, for a 1¼-inch pipe, a velocity of about 55 feet per minute. We will now assume that the flow and return pipes are 100 feet in length and that there are 12 right angle elbows and a valve on the run.

By Weisbach's formula $(0.0144 + \frac{0.01746}{\sqrt{V}}) \times \frac{l}{d} \times \frac{V^2}{5.4}$

= head or column of water required to overcome friction in a straight pipe, V being the velocity in feet per second, l the length and d the diameter of pipe. This is equal to 0.953 foot head. Now we have 12 quarter-turn elbows and a radiator valve, which is equal to 2 ells, or 14 elbows in all. Each elbow is equal to a loss of head of $\frac{V^2}{2.9} = 0.012$, which, multiplied by 14, equals 0.168 head lost by friction due to the elbows. With 0.953 foot lost by friction in the pipe and 0.168 by elbows the total loss is 1.121 feet. To produce the velocity necessary to supply the quantity of heat required with a 1¼-inch pipe we would need a head of 9 feet, and adding for the loss by friction, 10 feet would be necessary. As we cannot count on such a head, especially for radiators on the ground floor, we have to figure on a larger pipe. With a 1½-inch pipe we can do the work with a head of 4.5 feet, which is about all that can be safely counted on in practice for ground floor radiators. This accords well with experience, as the writer has always found that a radiator of 100 feet on the ground floor needs at least a 1½-inch connection, and in some cases it has been necessary to increase this size before good results were obtained. This figures out practically the same as the rule given for steam pipes; by taking a maximum of 84 feet of surface off a 1½-inch pipe and using that as a basis for fixing the table of sizes, the figures are just the same as for steam.

Application of the Rule for Different Lengths of Mains and for Different Pressures.—For each 100 feet or fraction thereof the mains are extended beyond 100 feet, use the ratio for one size smaller. Thus, if the plant required a 6 inch main for 100 feet, take the ratio of a 5 inch pipe for 200 feet and the ratio of a 4½-inch pipe for 300 feet, and so on.

In the case of pressure the reverse method may be adopted, and for each 2 pounds pressure it is proposed to carry a ratio of one size larger pipe may be taken. Thus, if 2 pounds is to be maintained a 9-inch ratio may be taken in place of 8 inch. If 4 pounds is to be carried the ratio of 10 inch may be taken, and so on.

We have by this formula a simple rule that will meet almost any case found in practice, and while the writer does not claim that the changes of the ratio for the long pipes or higher pressure are mathematically exact, they are conservative and will be found to accord well with practice.

Conclusion.—It seems proper to offer some data to prove the correctness of this formula, and the writer desires to call attention to these facts. The ratio given for small pipes is ample, as can be demonstrated by hundreds of plants in use; the sizes given for pipes from 1½-inch to 2-inch are larger than advocated by any previous writer, and they are twice as large as sizes given by Mr. Baldwin or Mr. Babcock; hence we must assume that on these sizes the rule is safe. We then follow the rule till we come to a 3½-inch pipe, and we strike the same ratio as advocated by Professor Carpenter, of 0.90 inch of ratio for each 100 feet of surface. At the 4 inch pipe we strike the rule of Mr. Baldwin and Mr. Babcock, and between the 8-inch and the 9-inch pipe we strike the ratio of 0.375, as given by Mr. Wolff. With a pressure on the pipes of 10 pounds, on a plant requiring a 10-inch main, the ratio from this rule would be 0.21, as against that of 0.19 given by Mr. Wolff. By this we see that even on large plants the rule is within what has been found safe practice by skilled engineers.

NOTES.

George I. Roberts & Brothers, Incorporated, 471 473 Fourth avenue, New York City, issue an attractive card calendar for the year 1898. The card, measuring 11 x 14 inches, carries a colored picture of their warehouse and of the interior of an engine and dynamo room. Brief reference is made to their stock of Steam, Water, Gas and Engineers' Supplies. The calendar is a neatly printed pad in the middle of the card. The firm also distribute a humorous circular calling attention to the Roberts' Leak Stopper for stopping leaks in steam and water pipes under any pressure.

Charles Brown, one of the oldest and best known residents of Castleton, Vt., died recently at his residence at the age of 82 years, survived by a widow and two children. Mr. Brown originally learned the trade of a tinsmith, and with the progress of the times took up the plumbing trade, and of late years followed the plumbing business exclusively, having worked at it a week previous to his death.

As noted in our trade columns, there is some disturbance in the markets for brass and iron fittings, valves, &c., due to the failure of certain manufacturers to maintain the list prices. It has not as yet affected the smaller trade, however.

A conference was held in Chicago this week between the president of the Western League of Master Plumbers, the president of the Central League of Master Plumbers and a committee from the Central Supply Association.

President A. C. Smith of the Board of Plumbers and Plumbing of Newburg, N. Y., and Plumbing Inspector Drew have been appointed by the board to revise the plumbing code of that city and have it printed in pamphlet form.

William Grady has opened a plumbing steam and gas fitting establishment at 113 Arnold street, Woonsocket, R. I.

Fred. A Wood is exhibiting a new acetylene gas generator in the office of the Electrical Supply Company, 113 North Second street, Cedar Rapids, Iowa.

The plumbing business carried on by the late Robert Mead, Topeka, Kan., will be continued by his three daughters under the management of their husbands, under the firm name of the Mead Plumbing & Steam Heating Company.

A. B. Sproul, New Haven, Conn., has a much finer showroom in his place of business since it has been rebuilt. He now has two fine show windows in which Heating and Plumbing Specialties are conspicuously displayed.

W. E. Kugemann, formerly secretary of the Ideal Boiler Company of Chicago, and latterly with the boiler department of the American Radiator Company, returned to London on the "St. Louis" on Wednesday with Henry S. Downe.

William E. Alford and B. Frank Lawder, January 20, formed a co-partnership under the name of Alford & Lawder, at Baltimore, Md., to carry on a Gas, Electric Fixture and Plumbing business.

The firm of Adams & Co., Mohawk, N. Y., have been dissolved by mutual consent, L. D. Ballard retiring from the partnership. He will, however, have charge of the manufacturing, repairing and plumbing departments for Mr. Adams.

The Reid Brothers Company of Brooklyn, N. Y., have been incorporated by Robert W. Reid, Peter J. Mount and T. C. Horsfield, with a capital stock of $10,000, to manufacture Plumbers' Materials, Steam Fittings, &c.

Dudley D. Norton will, it is reported, early in March start a plumbing establishment in Cazenovia, N. Y.

The seventeenth annual reunion and banquet of the Louisville Master Plumbers was held last week at their rooms in Court place, Louisville, Ky. Vice-President M. J. Duffy officiated as toastmaster, and the Entertainment Committee consisted of George Nolan, P. J. Brogan and J. Isaacs. The officers of the association are: President, W. H. Matlack; vice-president, M. J. Duffy; secretary, John Fleck; treasurer, John Ryan; sergeant-at-arms, J. Shouse.

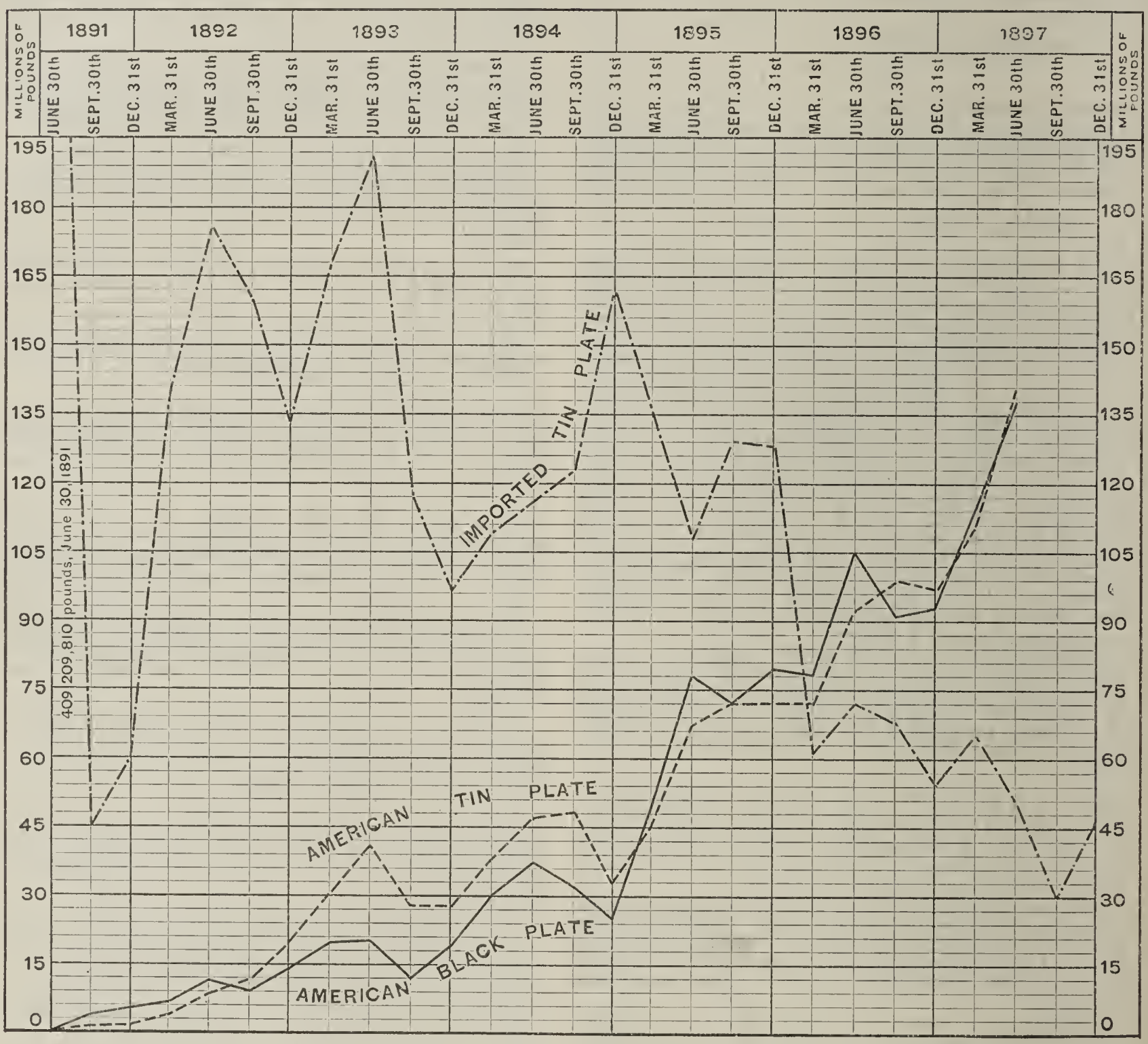
An advance was announced this week in the price of Galvanized Iron Range Boilers. Particulars of the same are given in the trade report columns of this issue.

R. M. Wilson, Rome, N. Y., has struck a good volume of natural gas on the ground occupied by his bathtub and plumbing goods manufacturing plant, and is preparing to make use of it.

TIN PLATES.

IMPORTATIONS AND DOMESTIC PRODUCTION OF TIN PLATES AND BLACK PLATES.

In *The Metal Worker* of November 28, 1896, we printed a diagram showing the production of American tin plates and black plates from June 30, 1891, to June 30, 1896. We present herewith a similar diagram carrying the domestic production a year later, up to June 30, 1897. We have also introduced what we believe will be scanned with interest, a line showing the course of tin plate imports from the time the McKinley bill went into effect, the first of July, 1891, until the 1st of this January. In the annexed diagram the imported tin plates are indicated by the chain line, the American tin plates by the dotted line and the American black plates by the solid line.



Importations and Domestic Production of Tin Plates and Black Plates

The most extraordinary feature of the diagram is the tremendous drop in importations between June 30 and September 20, 1891; in fact, the figures for the preceding quarter were so great that they would have carried the line far outside of the diagram, and it will be noticed therefore that we have brought the line of imports down from the top, the imports for the preceding quarter having amounted to 409,209,810 pounds. This figure fell in three months to 45,000,000 pounds, the obvious explanation being the new duty which came into effect and the fact that importers rushed their shipments through to get them in before July 1. From September 30, 1891, the imports rapidly rose until the quarter ending June 30, 1892, when they amounted to 175,000,000 pounds. A year later they advanced to 191,000,000 pounds, which is the highest point reached since the beginning of the American industry. From that time imports have declined in an irregular way, reaching the minimum quantity during the quarter ending September 30, 1897, when they were between 30,000,000 and 31,000,000 pounds. The last quarter they rose slightly, which is explained by the fact that there was a good deal of importing done by the oil interest. The line of imports, it will be seen, crossed the line of domestic production in the quarter ending March 31, 1896, since which time the domestic product and imported plates have been getting further and further apart.

It is interesting to trace the course of American black plate and tin plate. Between September 30, 1892, and the beginning of 1895 the tin plate product was a good many

million pounds ahead of the black plate product, due to the use of imported black plates, which were dipped in this country. In the quarter ending March 31, 1895, however, the black plate production got a little ahead of the tin plate production. Roughly speaking, the two have run parallel since then up to last June, and there is every reason to believe that a close approximation still continues between them. During the first six months of this year it will be seen that the lines of production almost coincide.

The Proposed Consolidation

of Tin Plate interests is still a topic of interested discussion in the trade. It is understood that the committee of manufacturers appointed to formulate a plan are quietly working in the matter, although it has not yet progressed beyond the theoretical stage. A large number of makers, however, are said to have expressed their willingness to dispose of their interests at a price. The question of what this price shall be is likely to prove an obstacle of large proportions in the path of the projectors of consolidation. There are many complex interests and considerations to be overcome before such an immense combination as is contemplated could be perfected. Much time and labor will be required to adjust conflicting ideas, and the difficulties to be overcome are so serious as to make many in the trade more than skeptical of the ultimate success of a movement of this character. Still, the idea prevails that, in view of the low prices and the keen competition now existing, some understanding or agreement among the makers is imperatively called for if the trade is to be continued on a basis of reasonable profits.

Welsh Tin Plate Exports in 1897.

Notwithstanding a decline of 27,574 tons in amount and of $1,760,000 in value in the exports of British tin plates to the United States in 1897 as compared with the previous year, the British Board of Trade returns show that the exports of the Welsh product to other countries made so marked a gain last year as to make an increase of 5000 tons in the total export shipments of Welsh plates over the figures for 1896. The gain in value over the previous year's exports, however, was not proportionately substantial, being only about $6000 on a total of $15,186,400. This is accounted for by a decline of about 6 pence a box in the price of the product which took place during the year.

The total quantity of tin plates exported from British ports in 1897 was 271,909 tons. From the subjoined table it will be seen that the most noteworthy increases in shipment were to France, Holland, Russia, the British East Indies and Canada, as well as to "other countries," which heading includes China and Japan. Besides the United States, shipments to Germany, the Argentine Republic and Australasia showed a decline. The following table shows the shipments in 1897 to each country in detail, making comparison with 1896:

To—	Tons. 1896.	1897.
Russia	19,755	30,924
Germany	14,122	11,285
Holland	7,232	8,697
France	11,881	13,896
Portugal, Azores and Madeira	5,191	6,663
Italy	2,916	3,289
Roumania	4,930	5,450
United States	113,049	85,475
Brazil	5,990	6,060
Argentine Republic	5,762	2,475
British East Indies	14,920	22,805
Australasia	15,758	12,252
British North America	17,695	21,863
Other countries	27,742	40,777
Totals	266,963	271,909

We would direct the attention of the readers to the Chicago price-list published in the back of the paper, where they will find quotations of Tin Plates according to the American base box system, which was explained at length in *The Metal Worker* of August 21, 1897. This scheme of quotations has been widely noticed, and some of the largest concerns in Chicago handling Tin Plates are enthusiastic supporters of it. In the East it has, perhaps, attracted less attention, but there are large firms who strongly urge its adoption on reasonable grounds. A very little study will familiarize the buyer with the features of the system and enable him to purchase on that basis without confusion.

SCRAP.

It is reported that the citizens of Hartford City, Ind., are seeking the establishment of a Tin Plate mill at that place.

In its latest report on the British Tin Plate trade the *Iron and Steel Trades Journal* of London says: "Makers just now find much difficulty in quoting for forward delivery, owing to the fear of further labor troubles, and unless masters and men come to an understanding and take common cause in protecting what remains of the Welsh Tin Plate trade there is every probability that it will go from bad to worse. The Americans have built up their Tin Plate trade by prohibitive tariffs, and now they not only have the industry firmly established, but, in contradistinction to our trade, we week by week hear of new mills being erected. Should this continue to any extent we shall hear of the Americans competing with Welsh Tin Plate makers in the neutral markets of the world."

The La Belle Iron Works, Wheeling, W. Va., manufacturers of La Belle Tin and Terne Plates, have almost completed the addition to their Tin Plate plant, which will double their capacity. Among the equipments added are two electric traveling cranes, which are being installed by Pawling & Harnischfeger of Milwaukee, Wis. The cranes are of special make, and are built to stand the heaviest kind of work. Each one is of the three-motor electric type. The Schultz Bridge & Iron Company of McKee's Rocks, Pittsburgh, have the contract for the buildings, all of which will be of steel and iron. A 500 horse-power Corliss engine is also being installed. It is expected to have the additions all completed some time in February, and will give the La Belle Iron Works one of the most complete Tin Plate plants in the country.

The plant of the Pennsylvania Tin Plate Company, New Kensington, Pa., is running full time in all departments, and with excellent prospects for the future. This concern have recently added two new mills to their equipment.

Zug & Co., Limited, of Pittsburgh, are operating their Sheet mills triple turn. This concern have recently installed a plant of fuel gas producers, built by Wm. Swindell & Brothers of Pittsburgh.

A correspondent at San Francisco, Cal., writes as follows, under date of January 17, regarding the outlook for the Tin Plate trade on the Pacific Coast: "There is no doubt that we will have the usual foreign importations of Tin Plate for the year, and no doubt also that the importation of American by rail will be very large. Considerable has come along during the off season, and there will be a rush of it later on in the year. As for price, it will be low, but cannot well be lower than it is now. The consumption will be very large. Notwithstanding the statements put forth early in the year the pack of salmon was greater last year than ever before known on the coast —over 3,000,000 cases or upward of 145,000,000 cans."

The Irondale Steel & Iron Company, Middletown, Ind., now have six mills in full operation manufacturing their Crane brands of Coke and Terne Plates. Recent repairs and improvements have been a success, and the entire plant is in first-class working condition.

A prominent Tin Plate maker is reported to have said that an offer of $100,000 was made at a recent meeting of the manufacturers to any one who could bring about an amalgamation of Tin Plate interests. This indicates the difficulties in the way of consolidation as well as the urgent desire for the adoption of heroic measures to check the downward tendency of prices.

The British Columbia canners have arranged a combination which includes practically all the canneries of any importance in that region.

The Leechburg Foundry & Machine Company of Pittsburgh have received an order from the Shenango Valley Steel Company for 30 doubling shears to be installed in their new Tin Plate plant now being built by them at New Castle, Pa. This is the largest single order for doubling shears ever placed at one time. The Leechburg Foundry & Machine Company have also received an order for a 36-inch doubling shear with engine attached for Norton Brothers of Chicago.

Charles V. McLean, for some years secretary of the United States Iron & Tin Plate Mfg. Company, at Demmler, Pa., has resigned his position and has removed to Philadelphia, where he has accepted a position with the *Evening Bulletin*. E. R. Cranford has succeeded to the position of secretary of the above company.

A cable dispatch from Paris, France, announces the death of Ernest Bazin, the inventor of the famous roller steamer.

THE RETAIL STORE.

Barker, Rose & Clinton Company.

Barker, Rose & Clinton Company, Elmira, N. Y., have been incorporated, succeeding the well-known house of Barker, Rose & Gray. The capital stock of the new company is $100,000, fully paid in. Capt. Frederick Barker is the president of the concern. Arthur Clinton vice-president, and Stephen Rose secretary and treasurer. The company will continue the wholesale and retail business in Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting and Athletic Goods, Paints, Oils, Glass, Cordage, &c. The company's establishment is large and well equipped. Their main store, which was built five years ago, is four stories high with basement. It is 64 feet wide by 100 feet in length. Adjoining this building and connected with it are lofts which cover 9000 square feet of floor surface. They also have two warehouses near the depot, one 40 x 140 feet and the other 40 x 72 feet. In the latter they carry their heavy goods, Nails, Glass, Horseshoes, Bar Iron, &c. The company advise us that the condition of business has been very good and that the outlook is much better than at any time during 1897. Under their new name the house will have the best wishes of the trade for their continued prosperity.

Iron Clad Dairy Pail.

Iron Clad Mfg. Company, 22-24 Cliff street, New York, are manufacturing a dairy pail as here illustrated. The feature of the pail as now made is the ear, a detail view

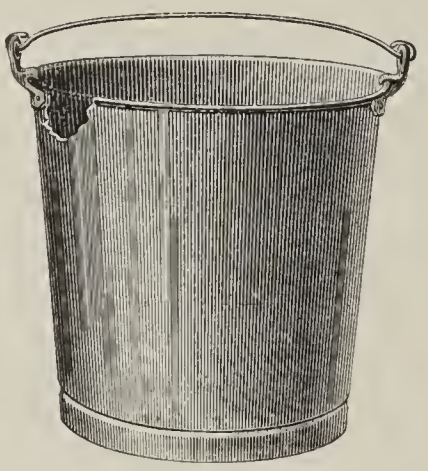


Fig. 1.—Iron Clad Dairy Pail.

of which is given in Fig. 2. The ear is so made and attached to the body of the pail that the strain from both directions is said to bear on the wire in the rim instead of on the rivets. This, we are told, obviates the annoy-

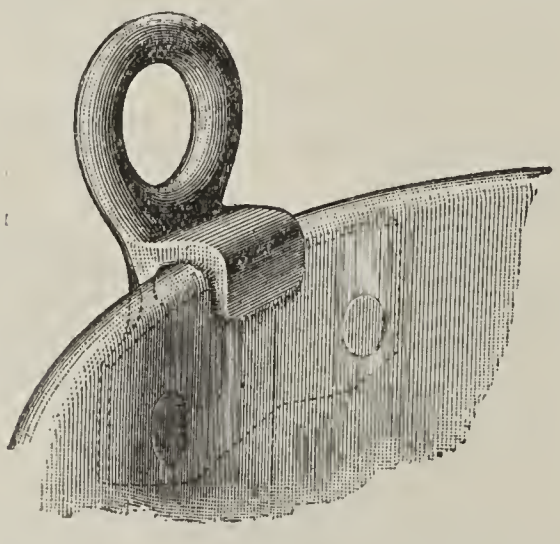
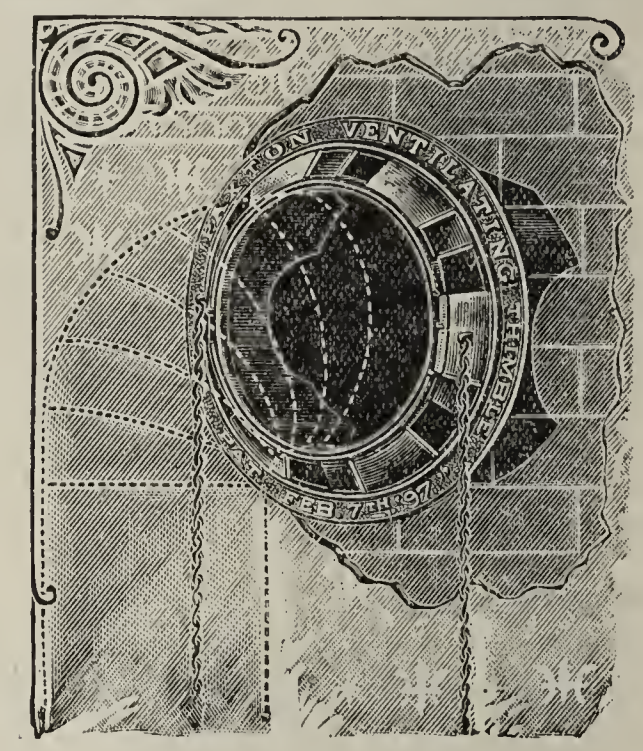


Fig. 2.—Sectional View, Showing Form of New Ear.

ance of ears coming off. The pails are made of IX and IXXX stock, in 10, 12 and 14 quarts capacity each, weighing 17, 20 and 23 pounds, and 23, 26 and 28 pounds to the dozen, respectively.

The Paxton Ventilating Thimble.

The Paxton Hardware Mfg. Company, Paxton, Ill., are sole manufacturers of a device herewith illustrated, which is intended to ventilate any room—kitchen, schoolroom, public hall, &c.—in which a stove pipe is used. It consists of a combined pipe collar and thimble, the collar being provided with openings and a circular revolving



Paxton Ventilating Thimble.

cap with corresponding openings. The cap is revolved by means of chains attached on the sides, as shown in the cut. When open, the draft in the chimney draws through the apertures the smoke, steam or noxious gases in the room. The device is stated to have proved very efficacious under varied circumstances, not checking the draft of the stove, but speedily freeing the room from smoke or odors. The thimble is manufactured in two sizes, 6 and 7 inches, and with japan, oxidized copper or nickel finish.

Ohio Retail Hardware Association.

A meeting of the Executive Committee of the Ohio Retail Hardware Association was held on January 6 at Hotel Chittenden, Columbus, for the purpose of going over the year's work, deciding on dates for the annual meeting and preparing a programme for it. Columbus being by far the most central point in the State and easier of access than any other city, had already been decided on at the last annual meeting as a permanent place of gathering.

Attending the preliminary meeting were J. P. Duffy, president, Greenville; John F. Baker, secretary-treasurer, Dayton; W. A. Remy, Mansfield, and Henry C. Wiseman, Springfield, the latter two constituting the Executive Committee for the year.

The annual meeting was appointed for the same dates as the meeting of last year, February 23 and 24, and at same place, Hotel Chittenden. It was found that some new members had been added during the year, but not nearly so many as could be wished for. The association hopes to see every hustling Hardwareman in Ohio in line within the next month and in attendance at the annual meeting, doing his share to take care of the retail Hardware interests of the State.

Many questions of importance will come up for discussion at the coming convention. There will be a Question Box, and abuses will be taken up with suggestions as to the best methods of correction. There will be short talks, long talks and there will be a banquet. A good pro-

gramme is in preparation. It was the sense of the Executive Committee meeting that since traveling men throughout the State were taking great interest in the association they should be asked to be present in a social way—in a business way if they prefer—submitting lines, samples, prices, &c.

We are advised that everything points to a most successful meeting and large accessions to the membership are anticipated. There are between 600 and 700 Hardwaremen in the State, many of whom are yet unconnected with the association, but it is hoped that the next meeting will see a good proportion of them enrolled as members and lending a helping hand to those who are so valiantly seeking to correct the numerous abuses which have crept into the trade. All the Hardwaremen of the State, whether members of the association or not, are cordially invited to the gathering. The secretary, John F. Baker, Dayton, will cheerfully answer all inquiries.

Wisconsin Retail Hardware Association.

A large attendance is looked for at the annual meeting of the Wisconsin Retail Hardware Association, which is slated for the 2d prox. at the Republican House, Milwaukee. The indications are that the representation will be larger than at any former gathering of the association. The fact that the association has made considerable progress in the direction of correcting the abuses which beset the trade has aroused the members, many of whom are working hard for the success of the organization and making splendid efforts to interest the Hardwaremen of the State who are not at present affiliated with it. A constant increase in interest and membership is reported, and the officials of the association are gratified with the way things are going. They are, however, anxious to broaden the membership as much as possible. The subject of the formation of a Northwestern Association, comprising the associations of half a dozen States in that part of the country, will come up at the meeting, and measures will probably be adopted looking to a conference with the officers of the other associations with a view to forming the organization. Some good papers are also being prepared for the meeting, which will reflect the views of some of the most enterprising and best posted merchants in the State, so that the meeting promises to be a very attractive and noteworthy one. A one and a third fare will be granted by the railroads on the usual conditions.

The Uncle Sam Sprayer.

The sprayer herewith illustrated is an insect and bug exterminator, patent just allowed, manufactured by the Paxton Hardware Mfg. Company, Paxton, Ill. In this



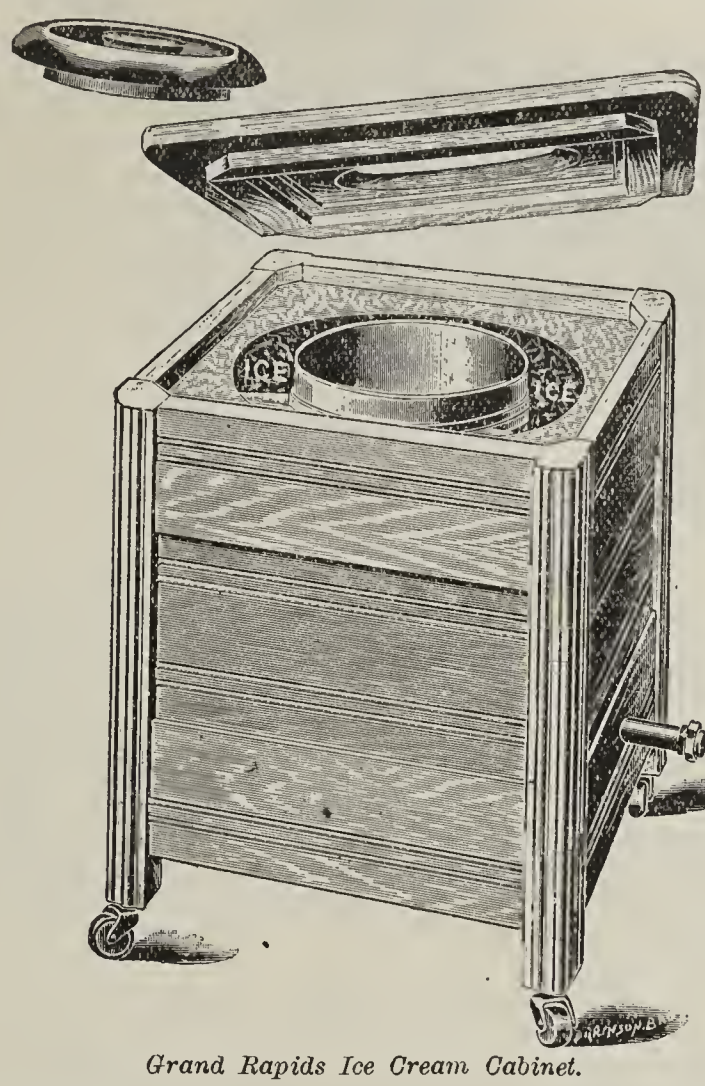
Uncle Sam Sprayer.

device powder or poison is mixed with water in any thickness or strength desired, and is then blown into the largest possible spray. The manufacturers state that it is the most economical device of the kind, spraying all sorts of liquids and can be used for many different purposes, including greenhouse, poultry house, flower garden, vegetable garden, the disinfecting of sick rooms, &c. Its length is 22 inches and it weighs 1 pound.

Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, with branches at 81 Michigan avenue, Chicago, and 87 91 North street, Boston, have just issued a revised illustrated catalogue and price-list of their Agate Nickel-Steel, Pearl Agate, Peerless, Crystal Steel, Blue and White and White Enameled Wares, which covers their entire product in these lines and supersedes all previous lists heretofore issued. The present catalogue, a book of 130 pages, contains several new and useful articles lately added to the assortment of the concern, which now covers almost every conceivable object of household and commercial use that can be formed of enameled metal. It is enriched by nearly 500 cuts of goods and contains a complete index which facilitates immediate reference to any article required. Two pages are devoted to a specific description of Agate Nickel-Steel Ware, which is claimed as the acme of ware for culinary utensils, and certificates of prominent chemists are given testifying to the absolute purity of the coating and its freedom from any injurious ingredient.

Grand Rapids Ice Cream Cabinet.

The Chocolate Cooler Company, Grand Rapids, Mich., have brought out a new line of ice cream cabinets, the



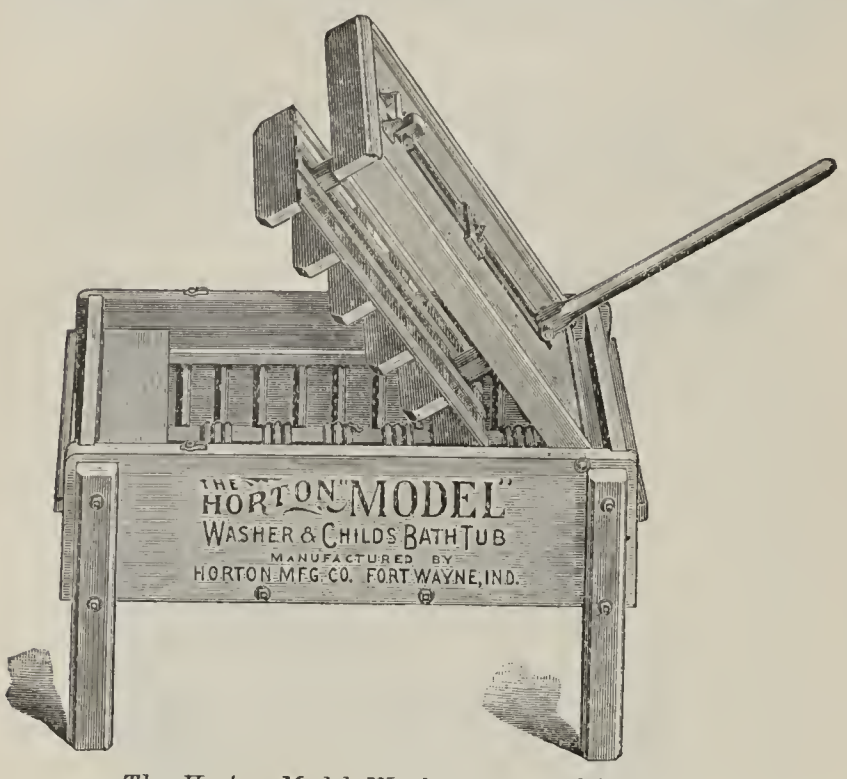
Grand Rapids Ice Cream Cabinet.

accompanying cut showing the 16-quart size. These cabinets are designed for use in connection with soda fountains or in ice cream parlors in place of a tub or pail. They are made of selected oak with solid corners, miter joints, securely doweled heavy covers, extra heavy galvanized iron lining and jacket, brass outlet and cap, and have a fine antique finish. Care has been taken to secure perfect insulation. Between the outer and inner casing are several layers of non-conducting material, while a 1-inch air space extends all round the box, which prevents any sweating. Only the best porcelain lined cans are used, so that there is no danger of taste of rust or tin. This line of cabinets comprises six sizes—namely, from 8 to 40 quarts. Cabinets are also made to hold two cans, three cans and four cans, to meet the demands of those carrying more than one kind of cream.

J. C. Stone, Post Office Drawer 456, Lansing, Mich., has issued a little circular illustrating his Safety Chimney Thimbles and Stove Pipe Fasteners, of which he is both patentee and manufacturer. The goods are described at considerable length, numerous illustrations being presented in order to show how the Fasteners are employed. A complete outfit consists of three pieces, and Mr. Stone suggests that the Safety Chimney Thimbles should be used with every chimney that is built. The goods are being placed on the market through the general hardware trade.

The Horton Model Washer and Child's Bathtub.

An illustration is herewith given of the Horton Model washer, which is also designed for use as a child's bathtub, and is the latest departure in the line of washing machines made by the Horton Mfg. Company, Fort Wayne, Ind., for whom C. M. Avery, 183 Lake street, Chicago, is sales agent. This machine is an improvement over their well-known Western washer in several respects.

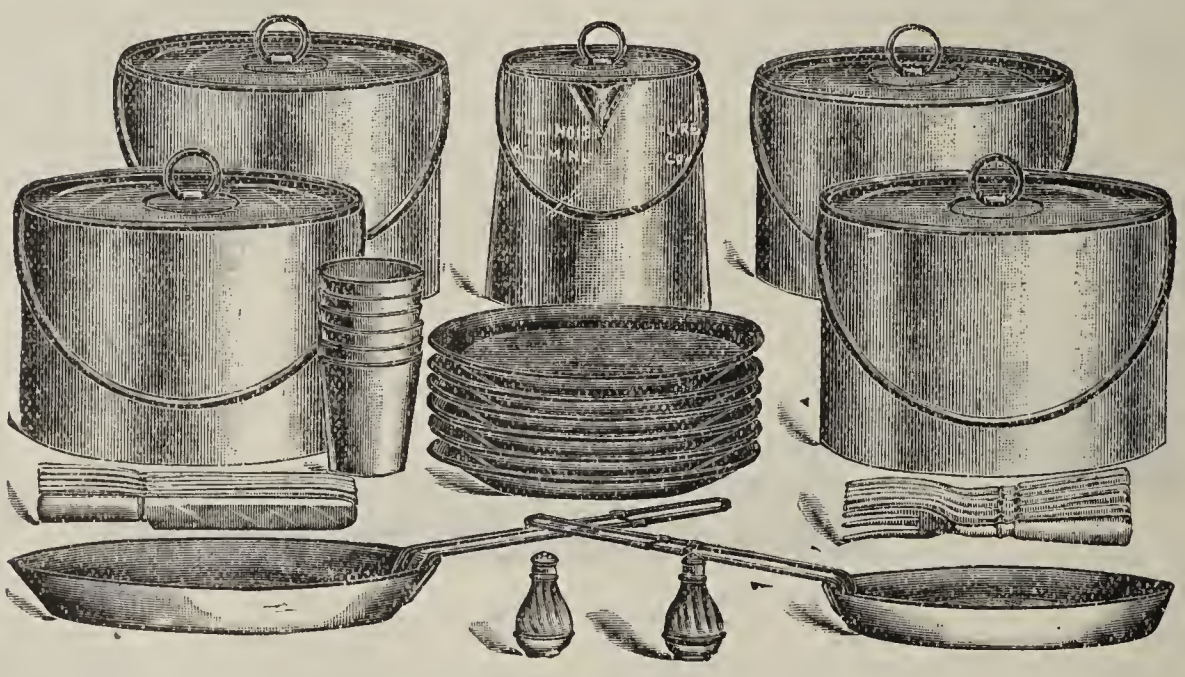


The Horton Model Washer and Child's Bathtub.

It not only has increased capacity, but in place of the old style pin wheel rotating in the center of the box the Model washer has a six-paddle dasher which operates the full length of the box. This not only agitates the clothes through the water, just as the pin wheel does to a limited degree, but also dashes the water through the clothes, thereby being doubly effective. The further claim is made that it is a perfectly noiseless machine. It has no gearing or iron parts to clash and rattle or require adjusting. The clothes are prevented from bunching by steel springs, which permit the dasher to raise and clear itself. It is made in one size only.

Aluminum Camp Outfit.

An illustration is presented herewith of one of the six-person aluminum camp outfits manufactured by the Illinois Pure Aluminum Company, Lemont, Ill. This camp



Aluminum Camp Outfit.

outfit is described as manufactured of the finest grade of pure aluminum and as absolutely seamless. There are 4 stewing pans made of heavy material, complete with covers and carrying bails; 1 coffee pot, 6 cups, 6 plates, 2 fry pans with detachable handles, 6 knives, 6 forks and 1 each pepper and salt shaker. The whole outfit nests in the larger pan, making a package 10½ x 7½ inches in size, weighing complete 12 pounds. The aluminum camp outfit is offered as a successful outfit for the Klondike or Alaska gold fields, the metal being very light and at the same time strong and durable. The outfits are made in three sizes—namely, for two persons, three persons and for six persons. The two-person set weighs 4 pounds and when nested is a package 9¾ x 6½ inches in size. The three-person set weighs 6 pounds, making a package when nested 10 x 6¾ inches in size. The six person set weighs 12 pounds and when nested makes a package 10½ x 7½ inches in size.

MEMORANDA.

John Orr, dealer in Hardware and House Furnishing Goods, 2033 Germantown avenue, Philadelphia, is building a new Hardware store which he is confident will be one of the finest stores in the city when completed. The new establishment will be 100 feet long by 16 feet wide, and will have two plate glass show windows. Mr. Orr will also continue his present store, which is 70 x 16 feet in dimensions, his intention being to devote one store to Hardware exclusively and the other to his line of House Furnishing Goods. The new emporium will be thrown open about March 1.

Jas. Watt of Thomasville, Ga., and D. Holmes, formerly of Harley & Holmes, Fitzgerald, Ga., have lately purchased the stock of the Boyd Hardware Company, Fitzgerald, and will organize a stock company under the name of Watt & Holmes Hardware Company. They will carry a full line of Shelf and Heavy Hardware, Mill Supplies, Harness, Tinware, &c.

P. M. Herron, Auburn. N. Y., has taken Peter Herron and William S. Ganey into partnership with him and organized the P. M. Herron Hardware Company. The company will do a wholesale and retail business in Iron, Steel, Shelf and Heavy Hardware, Stoves, Ranges, Furnaces, House Furnishing Goods, Tinware, Paints, &c. They have leased two additional floors over their present store, 34 and 36 Genesee street, and will entirely remodel the interior of the establishment. They will also put in a new two-story plate glass front. When the contemplated improvements are made the company expect to possess one of the best arranged and most convenient Hardware stores in that section of the State.

Barbee & Huncilman have succeeded Huncilman & Co., dealers in Stoves and Tinware, New Albany, Ind. The new firm intend to add a line of Hardware.

The Robinson Hardware Company have lately been organized at Gilroy, Cal., with a capital stock of $30,000. They will retail Stoves, Shelf Hardware, Builders' Supplies, Cutlery, &c.

Meriden Bronze Company, Meriden, Conn., and 30 Park place, New York, have just put on exhibition a new line of gas portables for table and desk use. The concern have been influenced in this addition to their lamp business by the greatly increased demand for incandescent lights with mantles, as made by the Welsbach and other companies. They are now showing 28 different styles in gilt and gold plate, having various styles of ceramic bodies in aurora, art bent glass, onyx, old brass and gold matte, which range in price from $1 to $15 each. Some of the centers are enameled in new colors in tints of gray to blue in the aurora and from cherry to reddish brown in ceramic.

Russia Cement Company, Gloucester, Mass., well known as manufacturers of Le Page's glue, are putting on the market the Essex flower food for house plants and window gardens, and they issue an attractively printed pamphlet of helpful hints for their care and management. This flower food is put up in small packages in handsomely lithographed covers which make showy shelf goods. The packages retail for 10 cents, and afford the hardware dealer a substantial profit. The goods are put up 12 packages in a case, and are accompanied by a beautiful colored hanger for the merchant, free.

STOVE TRADE NOTES.

REVOLUTION AND EVOLUTION OF THE STOVE TRADE.—II.

BY J. B. N.

The steady tread of other lines of business has been on the road leading to such a sharp competition and cutting of profits that the business was not worth the doing and then amalgamation in one form or another followed, so that profit cutting ceased and normal conditions prevailed. Is the stove business well on this road? Has it gone so far that amalgamation in some form, while not perhaps necessary, yet would be expedient? To the observer of events and cause and effect it would seem that there was something ahead of the manufacturers in the stove business of which they have not yet gotten a glimpse. They may have thought of it, they may have dreamed of its possibilities, but just what form it has taken in the mind is quite difficult to define. Something in the past has been happening in a regular, steady and strong force or tide of circumstances that has a meaning. Some of the stove manufacturers who were 10 to 15 years ago a power in the trade are no longer felt, and some are not even in existence, while others are shorn of their power to be aggressive.

Jobbing houses who did a good and large business five to ten years ago are not in existence to day, having been driven out of the trade entirely. Localities that 10 to 15 years ago made a majority of the stoves of the United States to-day make hardly enough to supply their little circle of 100 miles, and do not have vim and aggressiveness enough left in their bones to keep out competitors several hundred miles away. Formerly stoves from the East supplied the West, now stoves from the West are largely supplying the East, and this revolution is increasing.

All of these signs of the times, together with the tendencies of the presnt age to be quicker and move faster, mean something, and what do they mean?

Shall the Eastern manufacturers combine against the West and drive them out of the market, that naturally and by prior occupation belongs to them?

Shall the Pennsylvania manufacturers combine against the West to hold their markets?

Shall the Western manufacturers combine against the inroads which the East sometimes make and the Pennsylvania manufacturers continually make upon their territory?

Shall each section of the country combine against all outsiders and try and hold its own?

If so, then are there not too many manufacturers of stoves in some sections and too few in others, and isn't it a remedy that will necessarily cause a wiping out of existence of some? The fight for existence seems to be on. The stove trade must face it. Other trades have faced it and solved it in their own way, so must the stove trade. The West will not give up its trade to the East. The East will not give up its trade to the West. Is it wise to make it a fight to a finish, or amalgamate and save the best and let the others go?

That forces are working unconsciously toward an evolution of some kind in the stove business is beyond a question. What form it may take the future only can tell. Each man will try and hold on to the last; but couldn't his existence be made easier and more enjoyable to him and more profitable to others if these questions were settled before many a good man and true was driven to the wall?

The Rock Island Stove Company, Rock Island, Ill., have established a branch house at Kansas City, Mo. Geo. W. Blakesley will be manager and has already removed to the scene of his future labors and, it is to be hoped, successes. The establishment of the branch is expected to increase the company's Southwestern business materially.

Beebe Ranges and Furnaces.

The 1898 catalogne of the Beebe ranges and furnaces manufactured by Janes & Kirtland, 110-116 Beekman street, New York City, reaches us printed on fine paper in dark green covers with the address of the house on the first cover and their trade-mark, the word "Beebe," in gilt on the last page. The first illustration shows the Beebe French range, which is of steel construction. This is followed by the Beebe double oven range with four cooking holes over the fire. These ranges have been on the market a considerable time and have established a good reputation. An older pattern of the Beebe range is next shown, and is a type of range which can be found in many of the older first-class residences of the city. The next three pages show the 800 Series of the Beebe ranges, which are of modern type, adapted for builders use, furnished with either right or left hand oven and for the use of either horizontal or vertical boilers. One cut shows the range with high warming closet and the horizontal boiler incased above it. Several pages show Beebe ranges of smaller type, adapted for cheaper buildings. One page is devoted to a patent gas attachment designed to be used in connection with their 800 Series ranges. A three-burner gas hot plate is arranged to swing down on top of the stove when it is not in use with a coal fire, and can be lifted up under the warming shelf and used there to give additional cooking capacity to the range when the coal fire is burning. The next page shows the laundry range with water heating capacity sufficient for a 150-gallon boiler. Two other smaller laundry stoves are illustrated. The department devoted to furnaces is headed by the Beebe brick set furnace, adapted for either hard or soft coal and either portable or brick set. These furnaces are of the all cast iron type, and are followed by another furnace with a different construction of radiator, designed for cheaper trade. The last two pages are devoted to the Beebe furnace, a steel plate radiator and a half-tone engraving showing the furnace in knocked down condition, so that all of the parts may be readily seen. This furnace is made with straight fire pot to prevent the accumulation of ashes, with an anti-clinker revolving grate and a dust flue.

ODD PLATES.

Isaac A. Sheppard & Co. of Philadelphia, Pa., have a unique way of calling the attention of the trade to some of their leading specialties. A week or two since reference was made in these columns to the little pamphlet which they were distributing, discussing the proper method of warming a house, and now we have before us a card which they are sending out stating that "the State of Illinois has practically sanctioned the Paragon Furnace," at least that is the deduction which the manufacturers say may be drawn from the fact that the State University of Illinois has adopted as a text book in its Architectural Department the company's little volume entitled "Hints About Heating." The little work, we understand, is carefully written and represents the labors of an expert. It presents the problem of heating buildings thoroughly, scientifically and practically, leading logically up to the conclusion that the very best way to obtain the end desired is, the manufacturers intimate, by using the Paragon Furnace. The book is sent free to any one sufficiently interested to make application for a copy of it.

Lewis & Wanner, proprietors of the Peerless Steel Range Works, Chicago, Ill., have moved to 201-203 East Lake street, that city, where they have larger quarters and are more centrally located.

J. P. Lindemann & Sons of Milwaukee, Wis., have just issued, in the form of an eight-page folder, an Oven catalogue for 1898. Reference is made to their Stationary Ovens as having established an enviable reputation in the trade, and this year they are being manufactured with all the salient features of last season, but with several new and valuable improvements added. It is stated that the Folding Oven has steadily increased in popularity, while the improved Perfection flue system is referred to as equalizing the heat scientifically and making the Ovens rapid

and thorough in roasting and baking. Messrs. Lindemann & Sons are also general Northwestern agents for the Dangler Process, Gem and Junior Gasoline Stoves and the Wick and Wickless Blue Flame and White Flame Oil Stoves.

The Charter Oak Stove & Range Company of St. Louis, Mo., are distributing what is known as the Charter Oak Illustrated Almanac for 1898. It is a publication of 50 pages, bound in paper covers, and in addition to a large amount of astronomical data there is more or less light literature, some of it of a humorous character, while scattered through the pages are many illustrations of an interesting nature. As the almanac is issued primarily for advertising purposes it is natural to find no little reference to the Charter Oak Stoves and Ranges, the merits of which are set forth in a way to attract the attention both of the dealer and of the housewife.

A series of catchy little advertising novelties have been gotten out by the Standard Lighting Company, Cleveland, Ohio, which will be appreciated by the retailers of their goods. They consist of a dozen or so small drawing books for children, containing outline sketches covered by transparent paper on which copies of the sketches can be made. In each book, the central pictures relate to either the company's New Process Vapor Stove or their Blue Flame Oil Stoves. The covers are ornamented on the front by attractive pictures in colors, while the backs are devoted to advertisements of the New Process and Blue Flame Stoves, a blank being left for the name and address of the dealer at whose store they may be inspected. The company believe these little advertising novelties ought to help the retailer in extending the demand for these goods.

John P. Ley, 239 Water street, New York City, manager of the New York office of Charles Noble & Co., Philadelphia, Pa., showed in his sample rooms recently a fine sample Range which he had prepared for one of his customers. It was their Liberty Square Range, having an oven 20 x 22 inches in size. The Range was set on a nickel plated base and had the edges of the top and bottom nickel plated. The oven door was provided with a nickel name plate bearing the word "Liberty," and a nickel oven shelf. The end of the hearth and the boiler door were also nickel plated. The drop warming table at the oven end of the Range was handsomely nickel plated, and the top and elevated warming shelf and the back were similarly finished. In order to further contribute to the attractions of the Range the oven door, the ash door, the fire door and the end doors of the Range and the upright portion of the top shelf were highly finished in black japan and the relief portions of the ornamentation artistically treated with bronze. The Range was intended for a special window of a customer, and its handsome ornamentation is well calculated to attract attention.

J. G Sorgen, 79 Lake street, Chicago, Ill., manager of the Western branch of the Hart & Crouse Co., Utica, N. Y., attended the meeting of the Society of Heating and Ventilating Engineers, and while in New York paid a visit to the office of *The Metal Worker*.

The new stationery issued from the New York office of the Liberty Stove Works by the resident manager, John P. Ley, has the letter head embossed and printed in a brilliant red ink. At the left is a picture of the Goddess of Liberty and beneath the words "Stoves and Ranges." The words "Manufacturers of Stoves, Ranges, &c.," and the address of the house are also given, making a very attractive letter head. At the left, near the top, the name of William W. Noble appears as general manager. A business card has been prepared similar in appearance, so that those who correspond with the house will recognize at once a representative of the firm when the card is presented.

The Century Stove Company of Dighton, Mass., are favoring their friends in the trade with a neat calendar for the new year, the card being embellished with an imposing design in colors, likely to attract attention wherever displayed. A portion of the card is occupied with illustrations of the Century Grand six-hole Range and the Century Sheet Iron Surface Burner. The leaflets for the different months are attached to the card by means of a red cord.

The Fuller & Warren Company, Troy, N. Y., have completed arrangements for the following staff of traveling salesman, who will cover the territory indicated: F. C. Carpenter will look after the interests of the company in Greater New York and New Jersey; C. A. Miller in Northern New York, Vermont and Western Massachusetts; T. H. Harlow in the balance of the New England States; John M. Palmer in Western New York and Northern Pennsylvania, and C. K. Eastwood will travel in Central and Southern New York and a portion of Pennsylvania.

The P. D. Beckwith Estate, proprietors of the Round Oak Stove Works, Dowagiac, Mich., are distributing among their friends in the trade an exceedingly pretty calendar for the new year. A card measuring nearly 11 x 14 inches is embellished with a colored panel 5½ x 8 inches in size, representing a winter scene among the range hills of the Northwest, where the snow lies several inches deep and the wind is rapidly creating heavy drifts. A stalwart bull is the conspicuous feature of the foreground, leading the way for a herd of cattle following in crowded order a short distance behind. This picture, we understand, is an exact reproduction of a painting owned by Mr. and Mrs. Fred. E. Lee, the former being the general manager of the estate, and is presented on the card calendar as illustrating in the very best manner "the constant fearless onward march to greater success which has characterized and made famous the genuine Round Oak." The printed matter, which extends across the center of the card, appears in green and old gold letters, producing a very rich effect. Covering the leaves for the different months of the year is a slip on which it is stated that the calendar is presented with the compliments of the Beckwith Estate, and refers among other things to the fact that new decorations, improvements and additions to the Round Oak family have been perfected for 1898, and these will, it is expected, surprise and highly please the company's customers. The make up of the calendar is, as stated above, exceedingly neat, and there is provided a loop of white silken cord for hanging it up.

The 1898 catalogue and price-list of Registers and Ventilators made by William Highton & Co., Nashua, N. H., is a volume of 36 pages bound in colored paper. The get up of the pamphlet is exceedingly attractive, the paper being fine and the printing neatly done, while a couple of inset leaves of enameled paper show the appearance of bronze and plated register faces. In issuing this catalogue the manufacturers call the attention of their customers to a change in list prices, and request that they destroy all former lists. A very large variety of designs are illustrated in the pages of this volume, the patterns varying from a simple lattice to beautiful and elaborate scroll work. Registers, furthermore, of all types are noted, Vertical Wheel Registers, Round Registers and Ventilators, Convex Ventilators, Lock Vertical Wheel Ventilators, Circular Top Registers, Self Indicating Ventilators, Ceiling Ventilators, Ventilating Plates, &c., being some of the goods enumerated.

The business of William Kerby, whose success in handling Paragon Furnaces and Fidelity Ranges in New York, is well known to the trade, has been purchased by the manufacturers, Isaac A. Sheppard & Co., who will hereafter conduct it at the old stand, 4 and 6 Peck slip, as the New York branch of their extensive foundries in Philadelphia and Baltimore. The sale of goods will be more vigorously pushed than ever before, Mr. Kerby continuing with the firm in the capacity of sales manager, and enlarged facilities being provided for the accommodation of the customers of the house.

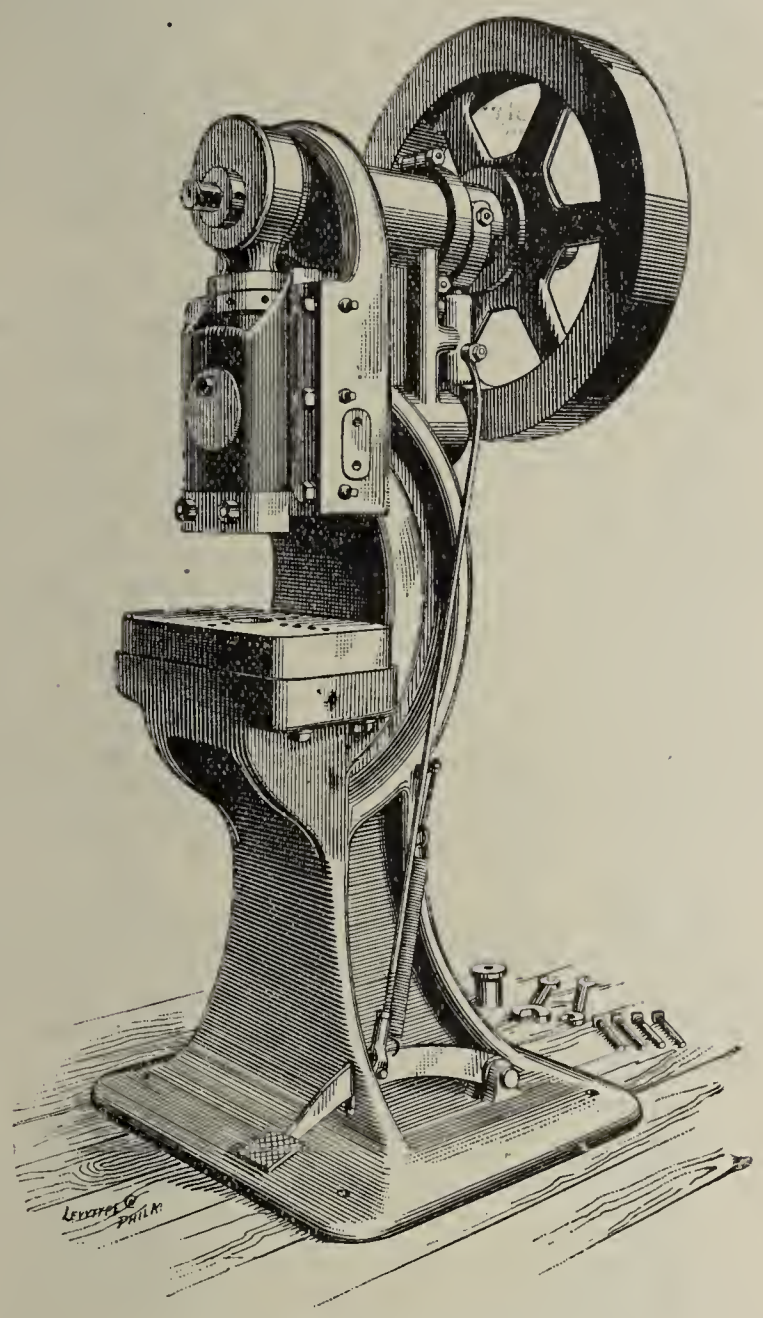
The Excelsior Steel Furnace Company, 38 and 40 West Monroe street, Chicago, have issued a bright little pamphlet, very attractively gotten up, which is descriptive of their Gas Ring. This Ring is a device used in the Excelsior Furnaces for the purpose of effecting complete combustion of soft coal and thus render this cheap fuel available in the operation of Furnaces and Heaters. It is stated that the device is thoroughly successful and that by the substitution of soft for anthracite coal, thus rendered practicable, the cost of fuel in many parts of the country has been reduced more than 50 per cent. The inner part of the Excelsior Ring is cast in sections, so that a piece can easily be replaced without disturbing the remainder of the Ring. The Ring is, however, made unusually heavy, so as to avoid the necessity of making frequent repairs. Its construction is also such that it cannot be clogged up.

The Tinware manufactory of F. A. Walsh & Co., at Milwaukee, Wis., was burned on the 22d inst. The factory is located at Thirty-fifth and Vliet streets, just on the western edge of the city limits. The water supply was such that only three engines could be worked and their principal service consisted in protecting adjacent buildings. The structure was 75 x 175 feet and four stories high. When the department arrived the third and fourth floors were burning fiercely and it took only a short time for the flames to reach the other floors. The loss is estimated by Mr. Walsh at $225,000 on stock and machinery and $75,000 on the building. The loss will be high on machinery, Mr. Walsh said, because the firm have to have special machinery for the work. There is an insurance of $250,000.

The Japanese cruiser "Kasagi" was launched at the yards of the William Cramp & Sons Ship & Engine Building Company, Philadelphia, on January 20. The vessel was named by Miss Helen Long, daughter of the Secretary of the Navy.

Improved Punching Press.

We show in the accompanying illustration a general view of a punching press made by the Ayars Machine Company, Salem, N. J., the machine having been designed with special regard for heavy work and durability. It is particularly adapted for punching articles and bars of heavy sheet metals. The shafts are of hammered steel working in long solid scraped bearings. An eccentric is driven on to a tapering bearing and fastened with a steel key and nut. The stroke can be changed to suit the requirements of the work. The ram has long bearings in V-grooves and is connected with the eccentric strap by a threaded steel pitman, which gives 3 inches adjustment to the ram. The bolster plate has holes tapped in it to which the work can be fastened. Two planed surfaces on opposite sides of the press are provided to which strippers, &c.,



Improved Punching Press.

may be bolted. The punch is inclosed in an enlargement of the shaft, which is forged solid. All parts are of steel reversible and hardened, so that durable wearing surfaces can be obtained. The machine is provided with a safety stop so that the shaft can be revolved to any position and the die set without throwing the belt off. The fly wheel is very heavy and has three points for the clutch pin to strike, less than one-third revolution of the wheel, it is stated, being lost before the shaft turns. The presses are made in three sizes, and there are also three sizes of geared presses, the latter being used when the thickness of the material is as great as the diameter of the hole punched and in any case where it is more than ½ inch in thickness.

The American Protective Tariff League.—William L. Strong was elected president of the American Protective Tariff League, to succeed Cornelius N. Bliss, at the recent annual meeting of that organization, held at its headquarters, 135 West Twenty-third street, New York. The other executive officers elected were: First vice-president, Le Grand B. Cannon; second vice-president, Joseph E. Thropp; treasurer, Chester Griswold; general secretary, Wilbur F. Wakeman; Executive Committee, T. M. Ives, New York; P. C. Cheney, New Hampshire; James Phillips, Jr., Massachusetts; William Barbour, New Jersey; Henry C. Valentine, New York. All of these officers were chosen by the new Board of Managers, which is composed as follows: Le Grand B. Cannon, Cornelius N. Bliss, Thomas Dolan of Pennsylvania, P. C. Cheney and Henry McCall of Louisiana. These managers are elected for four years. Secretary Wakeman presented a detailed report of the work done by the organization during 1897. He showed that $33,623.58 had been expended within that period in advancing the cause of protection. The league circulated 652,518 complete tariff documents, including 150,000 copies of the new tariff law.

Salem Nail Company.

The Salem Nail Company, 292 Pearl street, New York, are sending out samples of Cut and Wire Slaters' Nails, galvanized and tinned, and also made of yellow metal. This class of Nails the company make a specialty of, the Nails having large firm heads. They also manufacture Galvanized, Tinned and Copper Nails of various kinds, together with Tacks and Spikes. In this connection the company provide a "quotation card and directory of Nails," upon which is printed in convenient form the sizes and assortment of the different goods manufactured by them, arranged one item to a line, with space for prices. The card is printed with copying ink, and is designed to be filled out by the merchant, indicating the different kinds of goods required, and returned to the manufacturers, who will then quote prices. The goods enumerated include Boat Nails and Boat and Ship Spikes, Round Iron Rods, Hinge Plate or Chute Nails, Swedes Tacks, Zinc Nails and Tacks, Yellow Metal Nails, Nails and Spikes both cut and wire, Slating Nails, wire and cut, both galvanized and tinned, Slaters' Tools, Roofing Nails, Copper Nails, Boat Rivets and Washers, Anchor Nails, Bellows Nails, &c.

Alabama's Mineral Production.

According to Eugene A. Smith, secretary of the Alabama Industrial and Scientific Society, the production of minerals in Alabama during the year 1897, as reported by the producers, is as follows :

Coal	5,114,129	short tons.
Coke	1,252,624	short tons.
Pig iron	839,793	long tons.
Iron ore	2,112,400	long tons.
Limestone	289,973	long tons.
Bauxite	10,539	long tons.
Building stone	133,160	cubic feet.

The returns for brick and pottery were only partial.

FLASHINGS.

A recent report made to his Government by the Austro-Hungarian Consul at Yokohama, Japan, says that the imports of Sheet Iron into that country have increased of late to an extraordinary degree. The material imported was almost entirely of English make, although some came from Belgium, Germany and France. A considerable trade also sprang up last year in Galvanized Iron, which is being extensively used for the construction of factories. Especially large orders were placed by the Government for the building operations being carried out in Formosa. The imports rose about 70 per cent. in amount over the previous year. In this also England was to the fore, only a small amount being credited to Belgium and Germany.

The Cambridge Iron & Steel Company, Cambridge, Ohio, expect to have their two new Sheet mills in operation by April 1. The company are also installing additional annealing furnaces.

The Buffalo Expanded Metal Construction Company have been incorporated at Albany, N. Y., with a capital of $20,000.

The first special exposition devoted to the Acetylene industry is to be opened next April in Berlin, Germany, under the auspices of the German Society for Acetylene and Carbide. A number of contributions in the shape of exhibits and papers to be read at the congress that will be held in connection with the exposition have been promised from Germany and other countries.

It is reported from Berlin that Count Posadowsky, the German Minister of the Interior, is preparing legislation for presentation to the Reichstag to secure uniformity throughout the Empire in the laws relating to labor matters. The aim of the proposed laws is twofold—namely, to

TRADE REPORT.

METAL MARKET.

Pig Tin.—There has been a good steady movement of Tin into the channels of consumption, mostly through direct sales by importers, but wholesale prices have varied in a slight degree only and the market is quite steady. New supplies have been very moderate and below expectations, leaving the local statistical position in better shape than it has been for some time past. Small lots from jobbers' hands are unchanged in price, Straits Pig being quoted at 14½c. per lb.

Copper.—There has been no movement of unusual volume or character the past week, but a very good trade is being effected quietly, particularly on export account, and this has force enough to keep prices quite firm. Orders from domestic consumers were of very ordinary type and of comparatively small proportions individually, although the aggregate was rather better than in recent weeks. Dealers' prices for small lots from stock rule at about 12¼c. per lb. for Lake Ingot and 11¼c. for Ansonia Grade Casting Copper.

Sheet Copper.—A fair amount of business has been transacted during the week, especially in Cornice Copper, but consumers still limit their orders in large measure to current requirements. Buying for stock is not yet in evidence to any extent, although a few good sized contracts are noted. Manufacturers, however, are not generally willing to book orders for extended deliveries, looking for an early improvement in the prices of Manufactured Copper. Small lots of Sheet Copper from store are generally quoted by retailers on the basis of 15c. per lb., but this figure is not adhered to in all cases.

Pig Lead.—Business during the week has been somewhat disappointing, since lots of more than a few carloads were infrequently involved, while the demand from consumers and jobbers alike was tame, in the full meaning of the term. Little beyond a hand to mouth business is reported by dealers, who continue to quote American Pig in retail quantities at 4⅛c. per lb.

St. Louis advices are as follows: This metal continues to show additional weakness. Consumers are, apparently, well supplied, and at this writing are taking little or no interest in the market.

Lead Pipe and Sheet.—The demand for these materials does not yet show any sign of real activity. Sales are principally of small lots for current use and the volume of inquiry is merely moderate. Dullness is the reigning feature of the market, although the outlook for improvement is regarded hopefully. Jobbers in this section quote Pipe at 5½c. and Sheet at 6½c. per lb., subject to the usual trade discount.

Spelter.—Some increase is noted in sales of carload lots, but little if any business in larger quantities has been effected in this quarter. Prices are holding quite steady, however, in the face of heavy production. The consumptive demand in this quarter is of narrow proportions. Galvanizers and brass manufacturers appear to have contracted for their wants ahead some time ago and are not now in the market to any extent as buyers. Retail quotations for good Western brands hold at 4.40c. to 4.50c. per lb.

St. Louis advices are as follows : There is no change to note in Spelter. Consumers are willing to pay producers' prices, but buy only in small lots as their needs require.

Antimony.—There is fully the average jobbing movement and prices are steady at about 7¼c. for Japanese, 7½c. for Hallett's and 8½c. for Cookson's in small parcels.

Nickel.—Business of fair volume is being effected, and small lots remain at 38c. per lb.

Tin Plate.—American Plates have been selling in moderate quantities only. Large consumers have in most instances covered their present and nearby requirements and appear to be holding aloof pending the result of the proposed combination of manufacturers alleged to be under way. The week has been extremely dull so far as large business goes, but some improvement has been developed in the retail trade. The mills are all busy, and in some cases are believed to be accumulating stock, but there is at the moment little pressure to sell for extended delivery in view of the negotiations now pending, which may result in higher prices before long. While wholesale prices are rather weak and some recent sales are reported to have been made at the lowest figures of the year, jobbers' quotations show no appreciable change. Small lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are quoted about as follows, but these rates are not uniformly maintained : American Coke Tins, IC, 108 lbs., 14 x 20; Bessemer Steel, $3.50 to $3.60 ; do., 100 lbs., $3.40 to $3.50 ; do., 95 lbs., $3.35 to $3.45 ; do., 90 lbs., $3.30 to $3.40 ; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75 ; Allaway Grade, IC, 14 x 20, $4.25 ; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are in comparatively light demand, but importers ask former prices in the absence of any radical change in the foreign market.

Sheet Iron.—A slight falling off is noted in the volume of orders from Black Sheets and prices are not quite as strong as last week. Still some large contracts are understood to have been placed lately for both Black and Galvanized Iron, while others, which are pending, are likely to fall in at an early date. Some of the largest mills making Galvanized Sheets are filled up and are declining further orders for nearby shipments. Jobbers complain of considerable slackness in the demand in this vicinity. Small lots from stock are quoted at about 2.35c. to 2.40c. for No. 27 Common Black Sheets, and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows : The Stamping works are now placing heavy contracts for Black Sheets. Several good orders were placed last week, and an inquiry is now in the market for 2000 tons. The Galvanized Sheet trade is quite active, the actual business being reported larger than in Black Sheets. Small lots of Black Sheets from stock are higher, being now quoted at 2.30c. to 2.40c. Galvanized, however, is selling at 80 and 2½ per cent. off.

Old Metals.—An improved demand is reported for home consumption, while the export business keeps up in fairly good volume. Prices are firm, except of Tin Plate Scrap, which is $1 a ton lower. Dealers in this city and vicinity are paying about the following rates for moderate sized lots delivered here.

Heavy Copper	per lb. 9 c.
Light and Tinned Copper	per lb. 8½c.
Heavy Brass	per lb. 5¾c.
Light Brass	per lb. 4¾c.
Lead	per lb. 3¼c.
Tea Lead	per lb. 3 c.
Zinc	per lb. 2½c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$10.50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton	5.25
Burnt Iron, per gross ton	5.00
Tin Plate Scrap, per ton	3.50

THE IRON MARKET.

The situation is not essentially different to what it was a week ago. Pig Iron is weak and irregular, while Finished Material of all kinds is in active demand, but without betterment in prices. The volume of business is unprecedented for the time of year, but as a set off to this the capacity for production is also greater than ever before. The important feature is that many lines are now working up to their full capacity, so that if the demand continues, as seems probable, prices ought to be advanced a trifle.

Predictions in times like these have to be made with a good deal of reserve, but it is obvious to the most casual observer that conditions were never so favorable for a satisfactory business as they are to-day. The one objectionable feature is the extremely low prices which are ruling for almost everything in Iron and Steel, but even that is an excellent basis to build upon. It not only insures immunity from outside sources, but enables us to market an immense amount of stuff in other countries, and is in consequence a considerable relief to our own markets. This, moreover, is not likely to be a transient experience unless a materially higher range of prices cuts us off from that class of business.

Except in Pig Iron, the general situation seems to be extremely favorable, and it is believed that events in the

near future will prove that supplies are not in excess of requirements, even though some holders appear to be willing to sell long deliveries at low prices.

Pig Iron.—Lower prices have been made by producers in a good many instances, both in New England and in the New York territory, without leading to the closing of much new business. The Northern furnaces are more generally making concessions than for some time past. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $10.75 to $11.25; No. 2 Plain, $10.50 to $10.75. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.75; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

Philadelphia advices indicate that business in Pig Iron in that market has not turned out as favorably as was expected. Buyers are decidedly "offish" and sellers are correspondingly uneasy, and while there is no official announcement of a change in prices, sales are made at pretty much anything that can be mutually agreed upon. There is a kind of understanding that $11 is a bottom figure for No. 2 X Foundry, but it is doubtful if any quantity could be moved at that figure, and in some cases the line has not been drawn even at $10.75. In short the market is badly mixed, but it gives buyers a fine chance to cover their requirements on terms which seemed very unlikely a few weeks ago. General quotations for seaboard delivery are about as follows, with the usual rebate of freight differences at points south or west: No. 1 X Foundry, $12 to $12 25; No. 2 X Foundry, $10.75 to $11.25; No. 2 Plain, $10.50 to $10.60

The Chicago Pig Iron market is reported in good shape, sales being fully up to their shipments. Southern sales agents have also done well latterly in booking orders. Some of them report quite a good business for the week. The price of Lake Superior Charcoal Iron is reported to have settled on a somewhat lower basis, with large transactions following the break. Inquiries for all kinds of Iron are in the market. A special demand has sprung up for No. 3 Iron for use as a substitute for Cast Scrap, which is quite scarce. We quote for cash as follows :

Lake Superior Charcoal	$11.50 to $13.00
Local Coke Foundry, No 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.35 to 10.60
Southern Coke, No. 3	10.10 to 10.30
Southern, No. 1 Soft	10 85 to 11.00
Southern, No. 2 Soft	10.35 to 10.60

In the Pittsburgh district, the Bessemer Pig Iron market continues very dull, and prices are lower. It becomes more evident every day that too much Pig Iron is being made, and production will soon have to be restricted. Foundry Irons are very dull. We quote, f.o.b. Pittsburgh: No. 1 Foundry, $10.40 to $10.50; No. 2, $9.90 to $10; Bessemer, $9.75 to $10, depending on delivery.

Advices from the Cincinnati Pig Iron market are as follows : There is no big run of orders, only a very satisfacory total in tonnage made up of moderate lots, with just enough of sufficient magnitude to show that the big buyers are not asleep. Judging by the current rate of consumption and the number of inquiries in the market there is every indication that business will not slacken for some considerable time to come. The adverse conditions are that the market is unsteady as to price-list, and while perhaps a trifle more settled than a week ago, yet it is still more favorable to the buyer than to the furnaces. In the Northern field conditions are unchanged and the market is irregular and weak. There is no reason for changing the present price-list, though it is perhaps as much honored in the breach as in the observance. Quotations are as follows, f.o.b. Cincinnati :

Southern Coke, No. 1	$10.00 to ....
Southern Coke, No. 2	9.50 to ....
Southern Coke, No. 3	9.00 to $9.25
Southern Coke, No. 1 Soft	9.75 to ....
Southern Coke, No. 2 Soft	9.50 to ....
Southern Coke, Gray Forge	9.00 to ....
Southern Coke, Mottled	8.75 to ....
Ohio Silvery, No. 1	12.75 to 13.00
Ohio Silvery, No. 2	12.00 to 12.25
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

In St. Louis the movement in Pig Iron continues to expand from week to week. Sales during the week under review were numerous, and while none were particularly heavy yet the demand, emanating as it has from all quarters, indicates that comparatively few consumers have any large stocks on hand. Prices are firmly maintained, and some furnaces who are sold up some months ahead are asking an advance. We quote as follows for cash, f.o.b. St. Louis :

Southern, No. 1 Foundry	$10.25 to $10.75
Southern, No. 2 Foundry	10.00 to 10.25
Southern, No. 3 Foundry	9.75 to 10.00
No. 1 Soft	10.00 to 10.25
No. 2 Soft	9.75 to 10.00

CHICAGO REPORT.

Scrap.—Cast Scrap is very scarce and has advanced in price. Other kinds of Old Material are in improving demand. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	7.50	....
Malleable Cast	6 50	....
Stove Plate (free of burnt)	5.50	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8½c.
Copper Clips	....	9¼c.
Red Brass	....	8 c.
Yellow Brass	....	6¾c.
Light Brass	....	4½c.
Pipe Lead	....	3¼c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—Business continues in the same old rut. The ruling prices of carload lots of 12 tons minimum are as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	7.00	7.25
Council Bluffs, Iowa	7.00	7.25
Lincoln, Neb	7.15	7.40
Sioux City, Iowa	7.50	7.75
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.65
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.00	7.25
Davenport, Iowa	6.30	6.65
St. Joseph, Mo	7.00	7.25
Leavenworth, Kan.	7.00	7.25
Omaha, Neb	7.00	7 25

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

German emigration last year was the lowest since 1874, aggregating only 22,220 persons, against 32,114 persons in 1896. Since 1893, when 87,577 persons emigrated from the Fatherland, the decline has been steady.
render extended strikes more difficult and to enable the authorities to have more control over strike leaders and labor delegates. Recently a laborer at Ronneburg was sentenced to a year in jail for calling a non-union man an offensive name, while at Lubeck a striker was sentenced to nine months in jail for tearing up the time slips of two non-union workers.

A semi-official announcement from Rome states that the Italian Government has caused a proposal for a treaty of commerce to be presented to the Government of the United States.

A bill has been introduced in the New York State Assembly to assure to the New York & New Jersey Tunnel Company a perpetual franchise for the construction and operation of their underground road from the terminus of the Long Island Railroad at Flatbush avenue, in Brooklyn, to Cortlandt and Church streets, Manhattan. At present the charter only allows a 25-year franchise, and the officials of the tunnel company allege that the undertaking involves such a large capital, probably $7,000,000 or $8,000,000, and in connection with the Atlantic avenue improvement not less than $10,000,000, that they will not invest their money on any such basis as a 25-year franchise.

The Russian Government has lately placed a contract with the Compagnie de Fives-Lille, of Paris, France, for 80 locomotives for the East Chinese Railway.

THE HARDWARE TRADE.

There have been few developments of importance in the Hardware market during the past week. Trade in the Eastern part of the country is showing some improvement and a general confidence prevails, but in the West the improvement is more marked, though checked somewhat temporarily by storms and severe weather. Travelers who are now generally visiting their customers report on the whole a hopeful feeling, with indications of increased activity in building and the re sumption of enterprise among the people. In sections where, owing to abundant crops marketed at good prices, money is plentiful, there is naturally special promise for business. Prices are without notable change, but the market continues steady, with perhaps a slight weakness in a few lines. Both manufacturers and merchants are taking a hopeful view of the outlook.

Advices from Chicago.—The condition of the Shelf Hardware trade, which had been exceedingly good up to the middle of last week, has since then been unfavorably affected by the heavy storms which have prevailed throughout the Northwest. The first really severe general snow storm of the season has visited this region. Trains are delayed, mails are necessarily irregular and difficulty is experienced in traveling by the salesmen. Other influences than the weather are also affecting trade in Tinware and Metals, this branch of business being quite dull. The demand for staple goods in Shelf Hardware has recently been heavy for the season and it is expected that the volume of business in this direction will continue to increase with the approach of the time to expect spring trade.

Advices from St. Louis.—The Hardware trade continues to maintain the pace at which it started at the opening of the year. The demand is not confined to any particular class of goods, but general assortments are the rule. Dealers in farming communities are sending in substantial orders and report the outlook as being extremely promising. An encouraging feature of the demand is the heavy orders received for Builders' Hardware and general Mechanics' Tools, which is the best indication of returning prosperity. Collections are good.

NOTES ON PRICES.

Wire Nails.—During the past week the market for Wire Nails has been in about the same condition as for several weeks. The demand is fair, but not especially heavy, the trade not being disposed to buy in a speculative way, and yet placing orders enough to cover their early requirements.

Advices from Chicago.—Manufacturers report heavy shipments fully up to their output, with a constant stream of inquiries coming from all classes of buyers. The outlook is very good and no decline in prices is now feared. Jobbers are continuing to sell at the old rate of $1.60 for small lots.

Advices from St. Louis.—The market continues to be extremely active. Mills report a heavy inquiry for deliveries extending over the next three months, but are not disposed to book orders except for shipment during the current month. Prices are well maintained. Jobbers are asking $1.65 to $1.70 for small lots from store.

Cut Nails.—The Cut Nail market continues steady. The volume of business is measured by the needs of the trade.

Advices from Chicago.—This branch of trade has shown no change whatever, small lots continuing to sell at $1.45.

Advices from St. Louis.—There is no improvement to note in the demand for Cut Nails. Jobbers are asking $1.45, base, for small lots from store.

Barb Wire.—The demand is referred to as good for the season, and manufacturers are anticipating an early and a heavy business.

Advices from Chicago.—The movement is reported to be fairly up to the expectations of manufacturers, who are running their mills to full capacity and at the same time accumulating no stock. Barb Wire is moving out freely in mixed carloads with Wire Nails. The demand from the retail trade is very good for the season. Small lots from stock are quoted by jobbers at $1.60 for Painted and $1.90 for Galvanized.

Advices from St. Louis.—The market shows decided activity. The buying has commenced earlier than usual, and mills and jobbers alike report the volume considerably heavier than usual at this season. Jobbers report an active trade, and for small lots quote $1.70 for Painted, with the usual advance for Galvanized.

Smooth Wire.—The market for Smooth Wire is without special feature, and is perhaps on the whole not quite so strong as it has been.

Wrought Iron Pipe.—The market for Wrought Iron Pipe has continued fairly steady during the week, there being an active demand but some irregularity in prices. Merchant Boiler Tubes are in large demand and are quoted as follows: Sizes 2 to 2½ inches, discount 72½ per cent.; sizes 2½ to 6 inches, discount 75 per cent. Charcoal Iron Boiler Tubes are quoted as follows: Sizes 2 to 2¼ inches, discount 65 per cent.; sizes 2½ to 6 inches, discount 70 per cent.

Dover Egg Beaters.—Dover Stamping Company, Boston, Mass., announce a reduction in the price of Genuine Dover Egg Beaters as follows: New Dover (Dover Stamping Company), per dozen 75 cents, per gross $7; Dover Extra, family size, per dozen $2.

Arcade Mfg. Company.—Under date January 18, 1898, Arcade Mfg. Company, Freeport, Ill., have issued a sheet of net prices and discounts applying to their 1897 catalogue.

Brass and Iron Fittings, Valves, &c.—In consequence of the withdrawal of two prominent members of the association of manufacturers of Brass and Iron Fittings, Valves, &c., the market is for the present at least practically open and manufacturers' prices are somewhat irregular. Efforts are, however, being put forth to restore harmony, but there appears to be in the minds of the trade some doubt of the success of the efforts in this direction. Meanwhile, however, retail prices for these goods in this vicinity have not been changed, although there is a possibility of a reduction in the near future.

Range Boilers.—An advance of about 5 per cent. has been made this week in the price of Galvanized Iron Range Boilers. The following are the new retail discounts on these goods:

	Per cent.
Galvanized Iron Range Boilers to and including 52-gallon	65 and 5
Galvanized Iron Range Boilers above 52-gallon	60
" " " " extra heavy, to and including 52-gallon	65
Galvanized Iron Range Boilers, extra heavy, above 52-gallon	60

L. & G. Enameled Ware.—The January, 1898, price-list of Enameled Ware just issued by Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, superceding all previous lists issued by them, contains the following discounts:

	Per cent.
Agate Nickel-Steel Ware	40
Pearl Agate Ware	40
Peerless Ware	70
Crystal Steel Ware	50
Blue and White Ware	50
White Ware	33⅓

A. B. C. Beam Clamp.—Elsewhere in this issue is an illustrated description of the A. B. C. Beam Clamp, made by the Illinois Malleable Iron Company, 30-32 West Monroe street, Chicago. The price of these hangers is 40 cents each, with a discount to the trade.

Glass.—The demand from factories is reported as being such as to keep Glass moving rapidly for some time to come. It is questionable, however, whether the demand is equal to the output of both association and independent factories. To stimulate the placing of large orders for Glass the American Glass Company have made inducements of extra discounts for certain quantities of Glass purchased by April 1, for both Atlantic Coast and interior points.

White Lead.—There has been a further rise in the price of Linseed Oil, due to the enhanced cost of raw material, and higher prices for Lead in Oil are more confidently looked for. Up to the present date, however, the producers have held to their former prices. Orders are not coming in unusually free, however, and the demand is as tame as it was when Oil cost 4c. to 6c. per gallon less than it does at the present time. In Dry Lead there is only ordinary business for the season and no unusual demand, while prices remain without change of importance.

Red Lead.—Red Lead has been selling in ordinary way only, and prices have undergone no important variation.

Linseed Oil.—There has been a further sharp advance in the price of raw material, and all producers of Oils have raised their prices to partially correspond. Retail quantities are selling at 45c. to 46c. per gallon for Raw and 47c. to 48c. for Boiled.

Spirits Turpentine.—Under very steady trade demand and good holding here and at Southern points, prices have advanced about ½c. per gallon. Small quantities sell from store at about 36c. per gallon.

The launching of the new battle ships "Kearsarge" and "Kentucky" from the Newport News Company's yards has been postponed until March.

Pig Iron Production in 1897.

The American Iron and Steel Association has received from the manufacturers complete returns of the production of pig iron in the United States in 1897, and also complete returns of the stocks of unsold pig iron in the hands of makers or their agents at the close of the year.

The total production of pig iron in 1897 was 9,652,680 gross tons, against 8,623,127 tons in 1896, 9,446,308 tons in 1895, 6,657,388 tons in 1894, 7,124,502 tons in 1893, 9,157,000 tons in 1892, 8,279,870 tons in 1891 and 9,202,703 tons in 1890. The production in 1897 was 1,029,553 tons more than in 1896, an increase of almost 12 per cent. The increase was almost wholly in the last half of 1897, as will be seen from the following table of half yearly production in the last four years:

Periods.	1894.	1895.	1896.	1897.
First half	2,717,983	4,087,558	4,976,236	4,403,476
Second half	3,939,405	5,358,750	3,646,891	5,249,204
Totals	6,657,388	9,446,308	8,623,127	9,652,680

Large as was the production of pig iron in the second half of 1897 it was exceeded in the second half of 1895 by 109,546 tons.

Territorially distributed the production of coke and anthracite iron was as follows in gross tons:

	First half 1897.	Second half 1897.	Year 1897.
New York	106,301	131,623	237,924
New Jersey	37,863	57,833	95,696
Pennsylvania	2,148,700	2,480,946	4,629,646
Maryland	79,212	109,910	189,122
Virginia	153,252	154,138	307,390
Alabama	429,742	503,176	932,918
West Virginia	53,735	79,172	132,907
Kentucky	17,185	18,714	35,899
Tennessee	126,893	120,810	247,703
Ohio	590,922	774,160	1,365,082
Illinois	519,671	597,568	1,117,239
Wisconsin	15,243	71,749	86,992
Missouri	.....	12,369	12,369
Colorado	.....	6,582	6,582
Totals, 1897	4,278,719	5,118,750	9,397,469
Totals, 1896	4,839,539	3,473,344	8,312,883

The production in some of the different districts of Pennsylvania and Ohio was as follows:

	First half 1897.	Second half 1897.	Year 1897.
Pennsylvania:			
Lehigh Valley	157,705	116,916	274,621
Schuylkill Valley	163,446	112,279	275,725
Upper Susquehanna Valley	40,222	51,079	91,301
Lower Susquehanna Valley	98,771	149,163	247,934
Juniata Valley	41,389	31,353	72,742
Shenango Valley	221,044	325,411	546,455
Allegheny County	1,211,883	1,451,210	2,663,093
Miscellaneous bituminous	214,240	243,535	457,775
Charcoal	552	1,436	1,988
Ohio:			
Mahoning Valley	265,331	316,965	582,296
Hocking Valley	2,420	.....	2,420
Lake Counties	127,259	174,571	301,830
Miscellaneous bituminous	147,247	225,375	372,622
Hanging Rock bituminous	48,665	57,249	105,914
Hanging Rock charcoal	3,040	4,767	7,807

The production of Bessemer pig iron in 1897 was 5,795,584 tons, against 4,654,955 tons in 1896, and 5,623,695 tons in 1895. The increase in 1897 over 1896 was 1,140,629 tons. The production of basic pig iron in 1897 was 556,391 tons, against 336,403 tons in 1896. The production of 1897 was distributed as follows: New York and New Jersey, 79,041 tons; Allegheny County, Pennsylvania, 265,548 tons; other counties in Pennsylvania, 84,520 tons; Maryland, Virginia and Alabama, 97,562 tons, and Ohio, Illinois, Wisconsin and Missouri, 29,720 tons.

Production of Bessemer Pig Iron.

	First half 1897.	Second half 1897.	Year 1897.
Pennsylvania:			
Lehigh Valley	59,718	46,767	106,485
Schuylkill Valley	32,833	38,390	71,223
Upper Susquehanna Valley	40,222	51,079	91,301
Lower Susquehanna Valley	87,956	121,098	209,054
Shenango Valley	165,311	287,814	453,125
Allegheny County	965,219	1,225,384	2,190,603
Miscellaneous bituminous	151,960	161,179	313,139
Ohio:			
Mahoning Valley and Hanging Rock bituminous	155,248	231,270	386,518
Hocking Valley	2,420	.....	2,420
Lake counties	118,304	159,005	277,309
Miscellaneous bituminous	140,810	220,840	361,650
Maryland	58,222	92,883	151,105
West Virginia	53,735	79,172	132,907
Illinois	461,917	556,074	1,017,991
Michigan and Wisconsin	2,103	17,069	19,172
Missouri	.....	5,000	5,000
Colorado	.....	6,582	6,582
Totals	2,495,978	3,299,606	5,795,584

The total production of Pennsylvania was 1,503,219 tons during the first half and 1,931,711 tons during the second half, a total of 3 434,930 tons. For Ohio the figures are respectively 416,782, 611,115 and 1,027,897 tons.

The production of charcoal pig iron in 1897 was 255,211 tons, against 310,244 tons in 1896, a decrease of 55,033 tons. The production of spiegeleisen and ferromanganese in 1897 was 173,695 tons, against 131,940 tons in 1896 and 171,724 tons in 1895.

The limestone consumed for fluxing purposes by the blast furnaces in 1897 in the production of 9,652,680 tons of pig iron amounted to 4,247,688 gross tons, of which 3,680,666 tons were consumed by the bituminous coal and coke furnaces in the production of 8,464,692 tons of pig iron, 524 271 tons by the anthracite and mixed anthracite and coke furnaces in the production of 932,777 tons, and 42,751 tons by the charcoal furnaces in the production of 255,211 tons.

The stocks of pig iron which were unsold in the hands of manufacturers or their agents on December 31, 1897, and which were not intended for their own consumption, amounted to 656,489 gross tons, against 827,163 tons which were similarly held on June 30, 1897, and 711,649 tons on December 31, 1896. These figures of unsold stocks do not include pig iron sold and not removed from the furnace bank, nor pig iron manufactured by rolling mill proprietors for their own use.

In addition to the stocks of pig iron above noted as unsold on December 31, 1897, there should be added 218,489 tons in the yards of the American Pig Iron Storage Warrant Company, which had passed out of the hands of the makers, making 874,978 tons which may be said to have been then on the market, against 973,678 tons which were similarly held on June 30, 1897, and 847,686 tons on December 31, 1896. The total quantity of stocks in warrant yards on December 31, 1897, was 275,800 tons, against 221,600 tons on June 30, 1897, and 200,790 tons on December 31, 1896.

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Metal and Miscellaneous Prices.

CHICAGO, JANUARY 27, 1898.

Tin—

Straits pigs.....15⅛@15¾¢

American Tin Plates—

American Base Box Quotations.

Based on 32,000 square inches in a box, which is exactly 2 per cent. more than in the English base box of 14 x 20 Tin Plates. The American base box weighs 110 ℔ and the English base box 108 ℔.

Highest Grade Charcoal—Bright.

Size.	Base.	Contents.	Per box.
10 x 14,	110-℔	...240 sheets	.....$5.65
"	140-℔....	" "	..... 7.25
12 x 12,	110-℔....	" "	..... 5.75
"	140-℔....	" "	..... 7.50
14 x 20,	110-℔....120	"	..... 5.65
"	140-℔....	" "	..... 7.25
"	160-℔....	" "	..... 8.85
"	180-℔....	" "	.....10.45
"	200-℔....	" "	.....13.15

20 x 28 double the price of 14 x 20.

12½x17,	140-℔....120	sheets	..... 5.35
"	180-℔....	" "	..... 6.95

Second Grade Charcoal—Bright.

10 x 14,	110-℔....240	sheets	..... 5.10
"	140-℔....	" "	..... 6.15
12 x 12,	110-℔....	" "	..... 5.25
"	140-℔....	" "	..... 6.30
14 x 20,	110-℔....120	"	..... 5.10
"	140-℔....	" "	..... 6.15
"	160-℔....	" "	..... 7.25

20 x 28 double the price of 14 x 20.

Highest Grade Coke—Bright.

10 x 20,	110-℔....240	sheets	.....$5.75
12 x 12,	110-℔....	" "	..... 4.15
"	140-℔....	" "	..... 4.95
14 x 20,	110-℔....120	"	..... 4.00
"	140-℔....	" "	..... 4.85

20 x 28 double the price of 14 x 20.

20x26½,	110-℔....120	sheets	..... 8.00
20x29½,	110-℔....	" "	..... 8.85
20x32½,	110-℔....	" "	..... 9.90
"	140-℔....	" "	.....12.35
20x39½,	140-℔....	" "	.....15.00

Old English Method Quotations

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	..... $5.25
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	..... 6 75
	IXX, 14 x 20	..... 8.25
	IXXX, 14 x 20	..... 9.75
	IXXXX, 14 x 20	..... 11.25
	DC, 12½ x 17	..... 5.00
	DX 12½ x 17	..... 6.50
Allaway Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	..... 4.75
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	..... 5.75
	IXX, 14 x 20	..... 6.75
	IXXX, 14 x 20	..... 7.75
	IXXXX, 14 x 20	..... 8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	..... $3.75
	IC, 10 x 20	..... 5.50
	IC, 17 x 17	..... 7.75
	IC, 20 x 26½	..... 7.75
	IC, 20 x 29½	..... 8.50
	IC, 20 x 32½	..... 9.00
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	..... 4.50
	IX, 20 x 32½	..... 12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔	.....15¢
95 ℔	.....20¢
90 ℔	.....25¢
85 ℔	.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style,	
36 to 40 lbs. coating	...$13.00@$15.00
Redipped, or Good Old Style,	
20 to 30 lbs. coating	... 10.50@ 12.00
Worcester Grade,	
12 to 14 lbs. coating	... 8.00@ 9.00
S T P Grade,	
L	
10 to 12 lbs. coating	... 7.50@ 8.00
Dean Grade,	
8 to 10 lbs. coating	... 7.25@ 8.00

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		.....$7.25
IX, 14 x 28	.....$10.00	10.25
IXX, 14 x 28	..... 11.50	12.75
IX, 14 x 31	..... 11.50	12.75
IXX, 14 x 31	..... 13.00	14.00
		Per box of 56 sheets.
IX, 14 x 56	..... 21.00	$12.50
IXX, 14 x 56	..... 24.00	14.00
IX, 14 x 60	..... 23.00	13.50
IXX, 14 x 60	..... 27.00	15.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16...₩ ℔	2.00¢	2.40¢
17 to 20...₩ ℔	2.10¢	2.50¢
21 to 24...₩ ℔	2.20¢	2.60¢
25 and 26.₩ ℔	2.30¢	2.70¢
27.....₩ ℔	2.40¢	2.80¢

Russia, Planished, &c. 100 ℔.

Patent Planished, ₩ ℔, A....$10.20	5%
Patent Planished, ₩ ℔, B.... 9.20	dis.
Craig's Polished Sheet Steel	.....8½¢
U.S. Polished Sheet Steel No. 27 A	5.05¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake	.....11¾@ 12 ¢
Casting Brands	.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ ℔ additional.

Brazed Brass Tubing, (100 ℔ lots). (To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch	.....$0.35
Plain, ⅝ inch up to ¾ inch	..... .36
Plain, ½ inch up to ⅝ inch	..... .38
Plain, ⅜ inch up to ½ inch	..... .41
Plain, 5-16 inch up to ⅜ inch	..... .08
Plain, ¼ inch up to 5-16 inch	..... .65
Plain, 3-16 inch up to ¼ inch	..... 1.00
Plain, ⅛ inch up to 3-16 inch	..... 1.50
Plain, 2 inch up to 3 inch	..... .38
Plain, 3 inch and larger	.....Special.
Plain, smaller than ⅛ inch	.....Special.
Bronze and Copper	.....3¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.

Small lots	.....₩ ℔, 40¢
100-℔ lots	.....₩ ℔, 36¢

No. 2 (guaranteed over 90% pure).

Small lots	.....₩ ℔, 34¢
100-℔ lots	.....₩ ℔, 33¢

Nickel Aluminum Casting Metal.

Small lots	.....₩ ℔, 39¢
100-℔ lots	.....₩ ℔, 35¢

Special Casting Alloy, with over 80% pure Aluminum used in place of brass.

Small lots	.....₩ ℔, 35¢
100-℔ lots	.....₩ ℔ 30¢

Aluminum Rolled Rods, from ¾ to 1 inch diameter	.....₩ ℔, 58¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter	.....₩ ℔, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 ℔ or more. Less quantities, 5¢ ₩ ℔ additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	₩ ℔	₩ ℔	₩ ℔
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-℔ casks	.....5¾¢
300-℔ casks	.....5.95¢
Loose sheets	.....6¢

Solder—

Half and Half (50 x 50)	.....11¢
45/55	.....10½¢
Extra Wiping	.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson	.....8¾@9¢
Hallett's	.....8¼@8½¢

Lead—

Soft Pig Lead	.....4¼¢
Bar	.....5¢
Sheet	.....6¢

Leader Pipes—

Corrugated.....80&10%

Eave Troughs—

Galvanized	.....80&25%
IC Terne	.....75&5%
IX Terne	.....75&5%
Double Bead Galvanized Lap Joint	80&25%
Double Bead Galvanized Slip Joint	80&25%
Double Bead IC Terne Lap Joint	..75&5%
Double Bead IX Terne Lap Joint	..75&5%

Elbows—

Adjustable Tin	.....70%
Spiral	.....50&10%
Plain Tin	.....70%
Plain Galvanized	.....70&5%

Valleys—

Galvanized	.....75&5%
IC Terne	.....70&15%
IX Terne	.....70&15%

Gutters—

Galvanized Roof	80
Galvanized Quarter Circle, O. G. and Box	80

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection	.....$2.25 squar
Climax	..... 2.20 squar
The Lloyd Spanish Tiling	... 4.50 squar
W. J. Burton & Co.'s Roll Cap	3.00 squar

Subject to discount.

Metallic Shingles—

Cushman's	.....dis. $2.3

Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 2
IC Tin. .. ₩ square,	$4.75	$4.50
Galv..... ₩ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square

Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20	..$25.50 square
IC Tin, 14 x 20	..... 8.00 square
Steel Painted, 14 x 20	.. . 7.50 square

Cortright's Metal Slates—

14 x 20	.....$5.25 square
10 x 14	..... 5.50 square
7 x 10	..... 6.50 square

Cortright's Victoria Shingles—

10 x 14	.....$6.75 square
7 x 10	..... 8 50 square

Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine	.....8 @ 12¢
Iron Paint, Bright Red	.....₩ ℔ 2 ¢
" " Brown	.....₩ ℔ 1½¢
" " Purple	.....₩ ℔ 2½¢
" " Ground in oil, B. Red,	₩ ℔ 6½¢
" " Ground in oil, Red.	₩ ℔ 6½¢
" " Ground in oil, Brown,	₩ ℔ 5½¢
" " Ground in oil, Purple,	₩ ℔ 6½¢
Linseed Oil, Boiled, in bbls	.....42¢
Linseed Oil, Raw, in bbls	.....40¢
Mineral Paints	.....1 @ 3¢
Orange Mineral	..... .12¢
Pure White Lead in Oil	.....5½ @ 6 ¢
Dry White Lead in bbls	.....5 @ 5½¢
Red Lead, American	.....5¼ @ 5¾¢
Red, Venetian, English, dry	..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans	.....8 ¢
	kegs, 3 to 6 ¢
Sipe's Japan Oil, in bbls.,	₩ gal..... .34¢
Spirits Turpentine, in bbls.,	₩ gal..36½¢
Asphaltum, Trinidad Refined,	₩ ton.$45
Tarred Felt, 1 Ply,	₩ 100 ℔.....$1.25
Tarred Felt, 2 Ply,	₩ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply,	₩ roll 108 sq. feet..... ... .$1.25
Roofing Pitch,	₩ bbl of 300 ℔.....$3.00

NEW YORK, JANUARY 28.

The following quotations are for small lots:

luminum—

1 Aluminum (guaranteed over 99% ire), in ingots for remelting.
ll lots.....₩ ℔, 40¢
℔ lots.....₩ ℔, 36¢
minum Rods, from ¾-in. diam.
1 in. diam.....₩ ℔, 53¢
minum Sheet, B. & S. gauge.
In lots of 50 ℔s or more.

	6-in.	14-in.	24-in.
er than.....			
including.....	14-in	24-in.	30-in.
	₩ ℔	₩ ℔.	₩ ℔.
13 to 19.....	$0.38	$0.40	$0.43
20.....	.40	.42	.45
21 to 23	.42	.44	.47
24.....	.42	.46	.49
25.....	.43	.47	.50
26.....	.43	.50	.55
27.....	.44	.53	.58
28.....	.44	.53	.60
29.....	.45	.56	.65
30.....	.46	.60	.73

te.—Lots of less than 50 ℔s 5¢ ₩ ℔ a.

ntimony—

son.....₩ ℔, 8¾¢
ett's .....₩ ℔, 7½¢
nese .....₩ ℔, 7¼¢

rass—Planished.....net

l and Sheet .....35% off

rass and Copper Tubes

razed Brass Tubing—

n & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Round Tube.	Per ℔.
n. up to 2-in.....	$0.35
n. up to ¾-in.....	.36
n. up to ⅞-in.....	.38
n. up to 1 in.....	.41
¼-in. up to 1¼-in.....	.48
n. up to 5-16-in.....	.65
¼-in. up to ¼-in.....	1.00
n. up to 3-16-in.....	1.50
aller than ⅛-in.....	Special
. and larger.....	Special
. to 3-in., to No. 19, inclusive.	.38

35% off.

per & Bronze Tubing—

3¢ ₩ ℔ more than Brass.

nductors—

rugated. *Round or Square.*—

nized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
.....70%

Spiral Riveted.

nized.....50%
also *Elbows and Shoes; Eave ugh Miters; Strainers, Conductor.*

nductor Strainers—See *ainers, Conductor.*

pper—

ts, Pits and Flats ₩ ℔ 18½@19¢ basis
Ingot.
.....12¼¢
ia Grade Casting.....11¼¢
hed.....net
and Bolt.....15¢ ₩ ℔ basis

bes—See *Seamless Brass Tubes.*

ve Troughs—

List Feb. 1, 1895.
Slip Joint, Galvanized....80&10%
Slip Joint, Terne.....65%

ve Trough Mitres—

Slip Joint.....list, 25%

ws—Plain Adjustable—

.....70&10%
ized.....80%

Crimped Tubing.

ed or Galvanized.....35%

Stove Pipe--

Four-Piece.

4½	5	5½	6	7-inch.
0.70	.77	.82	.87	1.05 per doz.
.61	.66	.71	.74	....

ows and Shoes—

Flat Crimp.
.....35%
ized.....35%

rugated. *Flat Crimp.*

zed.....70&5%
Round or Square.
.....70&5%
zed.....70&5%

iinc—See *Petroleum Products.*

, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
to 16.....	₩ ℔, 2 00....	2.30¢
to 21.....	₩ ℔, 2.10....	2.40¢
to 24.....	₩ ℔, 2.20....	2.50¢
and 26...	₩ ℔, 2.30....	2.60¢
.....	₩ ℔, 2.40....	2.70¢
.....	₩ ℔, 2.50....	2 80¢
n B. B.....	₩ ℔, 4¢	

Russia, Planished, &c.

Russia, accord- assortment.....₩ ℔, 10¼@10½¢
hed.....6¢@10¢
Planished ₩ ℔, A, 9¾¢; B, 8¾¢ net
lished Sheet Steel.....₩ ℔ 8½¢

Galvanized.

Nos. 10 to 16.....	₩ ℔, 12¢	75&10& 5% off.
Nos. 17 to 21.....	₩ ℔, 13¢	
Nos. 22 to 24.....	₩ ℔, 14¢	
Nos. 25 to 26.....	₩ ℔, 15¢	
No. 27.....	₩ ℔, 16¢	
No. 28.....	₩ ℔, 17¢	
No. 29.....	₩ ℔, 19¢	
No. 30.....	₩ ℔, 21¢	

36 in. 1¢ ₩ ℔ higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₩ ℔.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per ℔.....38¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 ℔..... 6 ¢
Lead, Amn. White, in oil..... 6 ¢
Lead, Red, bbls. and ½ bbls..... 6 ¢
Lead, Red, kegs..... 6 ¢
Ochre, American..... 1½¢
Red Venetian, American..... 1¾¢
Linseed Oil:
Raw, ₩ gal..... .....45@46¢
Boiled..... .....47@48¢
Spirits Turpentine:
In bbls.....36¢
In cases.....44¢
Putty:
In barrels and ½ bbls..... ...1¾@2¢
In tubs.....1¾@2¢
In tin cans..... .....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 ℔ casks.

Fancy Lagos.....₩ ℔ 5 ¢
Clarified.....₩ ℔ 4⅞¢
Accra.....₩ ℔ 4¾¢
Half Jack.....₩ ℔ 4½¢
Cecilia.....₩ 100 ℔ $4.85
Choice Red.....₩ 100 ℔ 4.60

(Spot Oil, ½c. ₩ ℔ higher.)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline..... ₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves..65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897..... 40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....65&5%
Galvanized Iron Range Boilers above 52 gallon.....60%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..65%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%
Lion Galvanized Iron Range Boilers, 5 years' guarantee, to 52 gallon.50&10%
Lion Galvanized Iron Range Boilers, 5 years' guaranteed, above 52 gal..50%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized 50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.

Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ ℔.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₩ bbl. $1.47@$1.48
Rosin, E. & F.....₩ bbl. 1.52@ 1.60
Rosin, G. & H.....₩ bbl. 1.65@ 1.70
Rosin, I. & K.....₩ bbl. 1.80@ 1.90
Rosin, M. & N.....₩ bbl. 2.10@ 2.45

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.

Pennsylvania:

Best Bangor, ₩ sqr. .....$3.50@$4.50
No. 1 Bangor Ribbon..... 3.00@ 3.25
Pen Argyle, ₩ sqr..... 3.25@ 3.50
Peach Bottom, ₩ sqr..... 4.75@ 5.60
No. 1 Chapman, ₩ sqr.... 3.00@ 4.25
Lehigh Slates, ₩ sqr... .. 3.25@ 3.80

Vermont:

Sea Green, ₩ sqr.....$2.45@$3.05
Purple, ₩ sqr..... 3.75@ 4.00
Variegated Purple..... 2.25@ 2.90
Unfading Green, ₩ sqr... 3.50@ 4.00
Red, ₩ sqr..... 8.50@10.50

Solder and Soldering Fluids— Solder—

½&½ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs about 55 ℔, ₩ ℔..... .....4¢
5% dis.

Yager's Soldering Salts.
½ ℔ bottles, each.....30¢
Large quantities, ₩ ℔.....40¢

Soldering Coppers—

Per ℔.....15½¢@17½¢ net

Spelter—

Western Speiter..... 4.40@4½¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized 60%

Tin Pigs and Bars—

Banca, Pigs, ₩ ℔.....15½¢
Straits, pigs, ℔ ℔..... 14½¢
Straits, in bars, ₩ ℔.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Meiyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20....	6.75
" "	IXXX,	14 x 20....	7.75
" "	IXXXX,	14 x 20....	8.75
" "	DC,	12½ x 17....	4.25
" "	DX,	12½ x 17....	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20...	5.75
" "	IXXX,	14 x 20...	6.50
" "	IXXXX,	14 x 20...	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 ℔.....10¢
95 ℔.....15¢
90 ℔.....20¢
85 ℔.....25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 ℔ coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 ℔ coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 ℔ coating.....	8.00 @ 9.25
STP Grade, 10 to 12 ℔ coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ ℔.

Charcoal Plates, Bright—

Meiyn and Calland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke,	IC, 14 x 20.....	$4.25
	IX, 14 x 20.....	5.25

Terne Plates—

Worcester Grade,	IC, 14 x 20.....	4.25
	20 x 28.....	8.50
Dean Grade,	IC, 14 x 20.....	4.00
	20 x 28.....	8.00
Gilbertson's Old Method,	IC, 14 x 20..	7.50
	20 x 28..	15.00

Troughs, Eave—See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 1895.

1¼ and less, Plain ..... 57&10%
1¼ and less, Galv..... 50&10%
1½ and larger, Plain..... 67&10%
1½ and larger, Galv..... .... 55&10%
Screw and Socket Joint Casing.....65%
Inserted Joint Casing.....60%
Boiler Tubes, 2¼ inch and smaller.72½%
2½ inch and larger 75%

Zinc—

600 ℔ casks ₩ ℔ 5¾¢ | Per ℔.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Acid Swabs.
Sherman, J. S.. Cassopolis, Mich.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Wheeler, Russel & Son, Utica, N. Y.

Aluminum.
Hill-Whitney Aluminum Co., Boston, Mass.
Reymond & Gottlob, 26 Cortlandt St. N. Y.

Aluminum Ware.
Illinois Pure Aluminum Co., Lemont, Ill.

Architectural Ornaments.
Frand, Martin J. & Co., Camden, N. J
Friedley & Voshardt, Chicago, Ill.
Mullins, W. H., Salem, Ohio.
Willis Mfg. Co., Galesburg, Ill.

Accountants.
Wilkinson, Geo., Chicago, Ill.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Bronze and Bronzing Liquid.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

Building Paper
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Northrop, H. S., 40 Cherry St., N. Y.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Cocks, Ball, Basin and Stop.
Landers, Frary & Clark, New Britain, Conn.
Peck, Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros. Co., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.

Conductor Pipe Machinery.
Poorman Mfg. Co., Piqua, Ohio.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cork Pullers.
Arcade Mfg. Co., Freeport, Ill.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Mullins, W. H., Salem, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs. Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, Ohio.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Berger Bros. Co., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

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Curtis & Curtis, Bridgeport, Ct.
Oster Mfg. Co., Cleveland, Ohio.

Dinner Pails.
Kleckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dumb Waiters.
Energy Mfg. Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
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Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

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Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

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Eddy Electric Mfg. Co., Windsor, Conn.

Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Conn.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

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Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Expansion Tanks.
Koven, L. O. & Bro., 18 Spruce St., N. Y.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Tauntou, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

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Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

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Excelsior Steel Furnace Co., Chicago, Ill.

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Bergstrom Bros. & Co., Neenah, Wis.
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Brand Stove Co., Milwaukee, Wis.
Carton Furnace Co., Utica, N. Y.
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Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water St., N. Y.
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Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Pease, J. F., Fce Co., Syracuse, N. Y.
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Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Tubular Heating & Ventilating Co., Phila., Pa.
Wheeler, Russel & Son, Utica, N. Y.

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Keen & Hagerty Mfg. Co., Baltimore, Md.
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Kent, C. M. Mfg. Co., Baltimore, Md.
Wilson, F. Cortez & Co., Chicago, Ill.

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ollansbee Bros. Co., Pittsburgh, Pa.
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yon, Conklin & Co., Baltimore, Md.
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orton Tin Plate Co., Cambridge, O.
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epublic Iron Works, Pittsburgh, Pa.
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aylor, N. & G. Co., Philadelphia, Pa.
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Vood Co., Alan. Philadelphia, Pa.

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Weir Stove Co..... .. 80
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Willis M'g. Co..... 67
Wilson, F. Cortez & Co..... 21
Wilson, R. M..... 22
Wister, L. & R. & Co..... 80
Wood, Alan Co..... 71
Wood Co., W. Dewees..... 80

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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

Strictly A1 PLUMBER for country shop; must be strictly sober and first-class clean, smooth worker on new and jobbing work; one who understands steam and hot water preferred; state age and wages wanted. "W. & S.," office of *The Metal Worker*, 232-238 Willam street, New York City. Jan. 29

A young man with some experience in inside and outside tin work; must be honest, and wages reasonable. Otto J. Baertict, Troy, Ind. Jan. 29

A good all around workman at PLUMBING, TINNING and HEATING; one accustomed to jobbing; must be of sober and steady habits; good appearance; steady work; state wages and reference. "Plumber," General Delivery, Paterson, N. J. Jan. 29

An experienced FOREMAN for metal ceiling department; must be posted as to makng dies and operating drop presses; state experience and wages expected. Lock Box 472, Canton, Ohio. Jan. 29

A man, young and energetic, as FOREMAN in a furnace shop. John F. Foster Company, 6 Portland street, Boston, Mass. Jan. 29

SALESMN who has had experience in selling ranges and furnaces to building trade to represent company about to open branch in New York City; highest references required. "Western No. 129," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 29

An all round TINSMITH; would prefer a man who also understood steam, hot water and hot air heating; steady job to a steady man. "Tinsmith," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

A first-class all round TINSMITH and jobbing man for general country work. C. B. Frost & Co., Westboro, Mass. Jan. 22

A NICKEL PLATER; thoroughly competent to take charge of polishing and plating department; must have satisfactory recommendations. Address, stating age and experience, Great Western Stove Company, Leavenworth, Kan. Jan. 22

A first-class GALVANIZED IRON WORKER to take charge of large work; must be strictly sober and have good references. "Iron Worker," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

A practical MECHANIC to take charge of a fully equipped foundry and machine shop as superintendent. State terms and references. Lock Box 494, Poughkeepsie, N. Y. Jan. 22

Good TINNER; steady job to one who is sober and industrious. Address, with references, state experience and wages wanted, Fowler Bros., Lowville, N. Y. Jan. 22

SITUATIONS WANTED.

SALESMAN with an established trade in Western New York, Northwestern Pennsylvania with hardware, tinware and stove trade; open for an engagement for 1898; satisfactory references. "J. D. W.," 221 Eighteenth street, Buffalo, N. Y. Jan. 29

As SALESMAN in heating and plumbing line; expert in steam, water or hot air; would go on the road or take charge of retail department in any city. "P. B.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 29

As TINNER, by a young man 20 years of age; six years' experience at inside and outside work; some experience at pipe fitting. Perry Shipman, Celina, Ohio. Jan. 29

A permanent position by TINNER, PLUMBER and HOT WATER FITTER; 12 years' experience on furnaces and all kinds of job work; Northern New York preferred; strictly temperate. Ed. Henry, Lowville, N. Y. Jan. 29

Good line of hardware or specialties on commission for Chicago. "W. S.," 245 Peoria street, Chicago, Ill. Jan. 29

By a TINNER; 14 years' experience at all branches of the trade; 38 years of age; sober; reference. "Tinsmith," care McAllister, Tuckerton, N. J. Jan. 29

A SALESMAN calling on the hardware trade would like to sell tin plate, galvanized eave trough, sheet iron, stove piping, &c., on a commission basis in North and South Carolina. "Tin Plate," Box 67, Winston, N. C. Jan. 29

By a young man 18 as first-class PLUMBER'S HELPER; three years' experience; would like steady position; city or country. M. Seaman, 69 Rivington street, New York City. Jan. 29

Steady position by a PLUMBER and STEAM FITTER; can do all kinds of roofing and tinning, figure and estimate from plans; first-class references; steady and reliable; Southern States preferred. Post Office Box 184, Putnam, Conn. Jan. 29

SALESMAN, with an established trade with the hardware, stove and house furnishing trade through all the Southern States including Texas, wants good side line; good commission. "Side Line," 519 Freemason street, Norfolk, Va. Jan. 29

A practical STEAM and HOT WATER HEATER with a good understanding of plumbing desires to hear from manufacturers of plumbing or heating goods of merit, and who desire to sell same on commission; am open for engagement as salesman or workman, Canada or United States; sober; married; reference if required. "Plumber," Box 299, Peterboro, Ont., Canada. Jan. 29

By a TIN and SHEET IRON WORKER and GENERAL JOBBER; city or country; accustomed to gutters, leaders, heater and range work; eight years' experience; strictly sober; single man; can furnish good references if required. Henry A. Wolfson, 73 East 106th street, New York City. Jan. 29

A first-class American PLUMBER and FITTER who understands the business thoroughly and can give satisfaction, but who has had recent financial reverses, wishes position as journeyman or foreman; 12 years' experience. "American," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 29

By a young man as TRAVELING SALESMAN to handle hardware, stoves and furnaces; reference if required. W. L. Hill, 52 East Genesee street, Buffalo, N. Y. Jan. 29

By a good all around TINSMITH; 15 years' experience on furnace work, ventilating; inside and outside jobbing; temperate; single. E. Weirich, 90 Dewitt street, New Haven, Conn. Jan. 29

Modeler; first-class; long experience in iron and brass foundries, making castings; modeling after architectural drawings or own design; steady worker; wants position, city or country. "Modeler," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 29

Steady position by a PLUMBER; 25 years' experience; thoroughly versed on lead and iron, steam and hot water fitting; wages moderate; country preferred. Thomas Garrity. 537 West Fifth street, Plainfield, N. J. Jan. 29

By a young man who has had 12 years' experience as PLUMBER and GAS FITTER; steady; city or country. Henry N. Wills, 18 Dodworth street, Brooklyn, N. Y. Jan. 29

A HELPER for tinner or roofer with one and a halt years' experience. Daniel Bank, 23 Prospect street, Boston, Mass. Jan. 29

Experienced HOT AIR, HOT WATER and STEAM HEATING ENGINEER wishes to take charge or open Philadelphia branch or travel; well acquainted with Eastern trade. Post Office Box 323, Woodbury, N. J. Jan. 29

By a first-class PLUMBER; 15 years' experience; city or country. C. Curtin, 184 East Seventy-sixth street, New York City. Jan. 29

The advertiser and his partner would like to take charge of water works and electric light plant where steady and reliable men are required; would like to make contract by the year; can handle any kind of machinery on the market; correspondence solicited. John Bayder, 70 Fort street, East, Detroit, Mich. Jan. 29

Steady job as TIN and SHEET IRON WORKER; range, heater and boiler work; also roofing. J. S. Young, 138 Orchard street, New York City. Jan. 29

By a practical TINSMITH; German; for inside and outside work; steady position; city or country; wages moderate. Charles Stark, 443 Main street, Paterson, N. J. Jan. 29

By a good helper in a plumbing shop; city or country. Jacob Lous, care of Mr. Adler, 635 East Fifth street, New York City. Jan. 22

As resident or traveling SALESMAN with furnace and stove house; can furnish best of references as to character, ability, &c. "F. L. C.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

As ESTIMATOR, SUPERINTENDENT, FOREMAN or CUTTER with cornice and skylight firm. "E.," 317 Mississippi avenue, Joliet, Ill. Jan. 22

By a CORNICE CUTTER; one who is capable of taking charge of shop; ten years' experience. "T. M.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

By an experienced TINNER on inside and outside work; can clerk in store; young man; honest, sober and not afraid to work; references. "Z.," General Delivery, Ft. Wayne, Ind. Jan. 22

By a TINNER who can do tin and slate work; temperate; married. P. O. Box 792, Barnesville, Ohio. Jan. 22

By a first-class PLUMBER; city or country. Thos. McCarthy, 99 Nostrand avenue, Brooklyn, N. Y. Jan. 22

By a PLUMBER, GAS FITTER, ROOFER; understands tinsmithing; new work and general jobbing; reference and license; city or country. A. Yach, 718 Second avenue, New York City. Jan. 22

A young man with over 12 years' experience in the stove and tin business desires a permanent position; can give exceptional references; with one firm 12 years; practical tinner; capable of taking charge of store; can give bonds. "Stove Store," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

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By a CORNICE CUTTER and TINSMITH as general workman. "E. B.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

Steady position with reliable firm by a first-class SPINNER; a good all around mechanic on round and oval work; any kind of metal; 22 years' experience; sober and steady. H. Meisterknecht, 446 East Seventy-sixth street, New York City. Jan. 22

As FOREMAN in a cornice or sheet metal shop, by a practical draftsman and an accurate estimator; good references as to character and ability. A. C. Acton, 522 North Second street, Camden, N. J. Jan. 22

As PLUMBER'S HELPER. Joseph Levitt, 246 East Fourth street, New York City. Jan. 22

By a TINSMITH; a first-class mechanic, with the best of references from last employers; a steady position. Frank Brand, 156 East 103d street, New York City. Jan. 22

By a first-class CORNICE and SKYLIGHT MAKER and CUTTER; able to work at the bench as well as at the drawing table; wages very reasonable; best of references. "Cornice and Skylight," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 22

As SUPERINTENDENT or FOREMAN, by man of experience in the manufacture of sheet metal goods; competent in the management of men and machinery and a hustler: some experience as traveling salesman and sales manager; best references furnished. 'Hustler," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 22

By a first-class CORNICEMAN; inside or outside work; a hustler; will be willing to work for moderate wages; New England States preferred. "B.," 200 Marion street, East Boston, Mass. Jan. 22

By a practical steam fitter, hot water heating and ventilating engineer, as SUPERINTENDENT or FOREMAN; thoroughly versed in estimating, soliciting and superintending high and low pressure work, ventilating fan work; best of references. "F. A. H.," 16 North Seventh street, La Fayette, Ind. Jan. 22

Young man who is thoroughly versed in geometry and mensuration wishes position as CUTTER in cornice shop anywhere in Illinois. "Geometry," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 22

As FOREMAN or STOVE MOUNTER, by a first-class man over 20 years' experience. Henry Guyer, 375 Central avenue, Albany, N. Y. Jan. 22

Side line by a SALESMAN with an established trade in New York and New England States; visits harness and carriage repositories, hardware and department stores. J. L. Cato, 326 Troupe street, Rochester, N. Y. Jan. 22

By young man of ten years' experience in tinning, plumbing, roofing and furnace work; an all around hustler; not afraid of work, and can sell hardware, keep books, &c.; age 25; married; strictly sober; can furnish best references; permanent position wanted. Box 25, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Jan. 22

By a TINSMITH, ROOFER and SHEET IRON WORKER. Lewis Kronovitz, 268 East Fourth street, New York City. Jan. 22

By a TINSMITH, ROOFER and SHEET IRON WORKER. B. Wolf, 38 Lewis street, New York City. Jan. 22

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1	300 lb. Foot Press	30.00
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1	3 x 40 Single Back Geared Slip Roll on legs	60.00
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1	7½ in. Can Body Former	35.00
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1	" " "	2.25
1	" Tinners' Bench Machines	5.00
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	Hollow Punches, all sizes, per inch	.50
12	Square Pan Creasing and Cullender Swedges each	2.50
1	Rotary Slitter	10.00
1	Stove Pipe Threader and Beader	25.00
1	11 in. Tube Former	20.00
2	15 in. " Formers each	35.00
1	8½ x 37½ Power Crimping Machine	250.00
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Cornice Maker, Tinner and Slater can rent an established shop with good paying trade; no competition, and good list of tools; all for $25 per month. Lessee must be competent and responsible and able to carry his own stock. Address "SNAP," office of *The Metal Worker*, 512 Commercial Bldg., St. Louis, Mo.

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4 ft. Heavy Bending Brake for 12 Iron.

1 Deep Throat Hand Lever Punching Press, capacity ⅜ x ⅜. Quote price and send cut and full description.

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Hardware, Stove and Tinware Store, Tin Shop attached, doing good business, established twenty-five years. Central location in county seat. Will give satisfactory reason for wanting to sell. Will reduce stock to $2000. Address P. O. Box 204,

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We want to buy, second-hand and in good order, the following:

1 No. 30 Bliss Power Press.
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1 Size B Flanging and Beading Machine, including Swivel Apron.
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Also dies for coffee pot and bucket covers, cup bottoms, coffee pot bottoms and any other dies for pieced tinware. If you have any of the above please advise how long used and give price. Address "PRESSES AND DIES," office of *The Metal Worker*, 512 Commercial Bldg., St. Louis.

$1,000.00 will purchase machines, stock and good will of an established Slate, Tin and Iron Roofing and Cornice Business in a town of seven thousand inhabitants in Southern Illinois. There is no one else in the same line of business in the town. There is a very large population in the surrounding country and the opportunity to purchase an established and profitable business is exceptional.

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—A PROFESSOR at one of our universities," says *The Christian Work*, "is the subject of a queer anecdote. Last winter he was married, and went to housekeeping outside town. This spring he thought he would add a few hens to his stock; he always had a dog. He set a couple of hens, and in good time had two large broods of chickens. He was very proud of them, but in a week or so the fowls began to die. The professor called in a neighbor to look at the chickens and offer advice. They were certainly a dilapidated lot of chickens that the neighbor viewed. They were thin, and apparently without ambition.

"'What do you feed them?' asked the neighbor, after a brief survey.

"'Feed them?' responded the professor, as though he didn't hear right. 'Why, I don't feed them anything, I thought the old hens had enough milk for them.'"—*N. Y. Tribune.*

—"SORE throat, eh?" said the surgeon to a member of a military band, according to the *Chicago News*. "Let me see. Oh, that's not so bad. A slight irritation—nothing more. You'll be all right in a day or two. I think you had better take no risk in renewing the trouble by using your throat, though, so I will recommend you for a fortnight's sick leave." Armed with the surgeon's certificate, the bandsman obtained his two weeks' sick leave. The two weeks had just come to an end, when he met the surgeon on the parade ground. The bandsman saluted. The surgeon recognized the face and stopped. "How's the throat?" he asked pleasantly. "It's quite well, sir," was the reply. "That's good," said the surgeon. "You can get back to your duty without fear. By-the-way, what instrument do you handle in the band?" "The small drum, sir," said the musician.

—BEFORE the days of chloroform there was a quack in San Francisco who advertised tooth-drawing without pain. The patient was placed in a chair and a wrench given, when he roared violently. "I thought you said there was no pain." "So there is not by my process. That is Cartwright's way. That's the way he does it. It's very different from mine." Another tug, and a still more violent howl. "That's the way Dumerge pulls teeth," said the unabashed practitioner. "You don't like it, no doubt. Who would?" Another twist was given, and the patient, as a rule, howled worse than ever. "That," the dentist says, "is Parkinson's mode." By this time the tooth was nearly out. "I will now," he said, "display my own method," whereupon he triumphantly withdrew the tooth and held it up for inspection. "You observe that by my truly scientific process there is really no pain whatever."—*N. Y. Tribune.*



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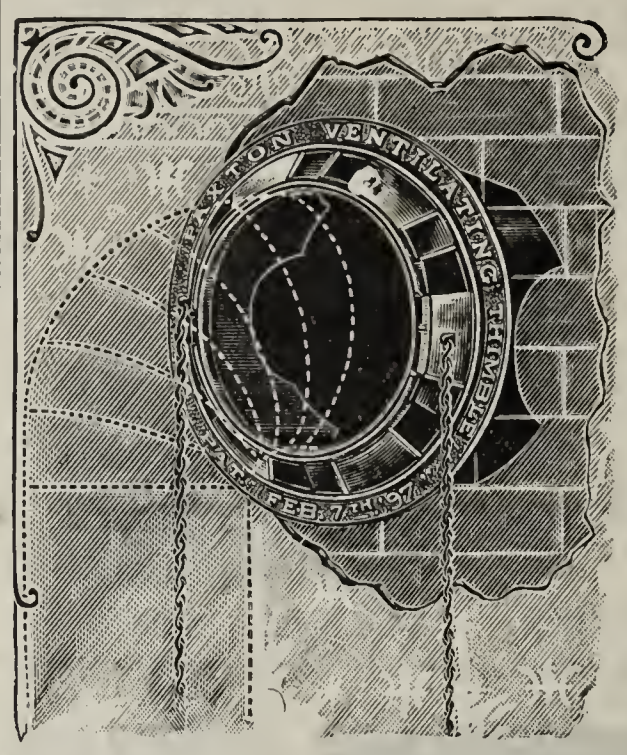
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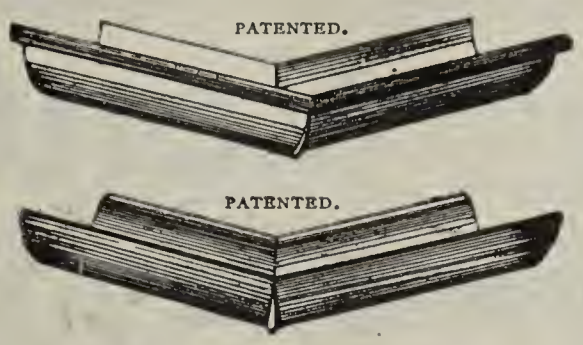
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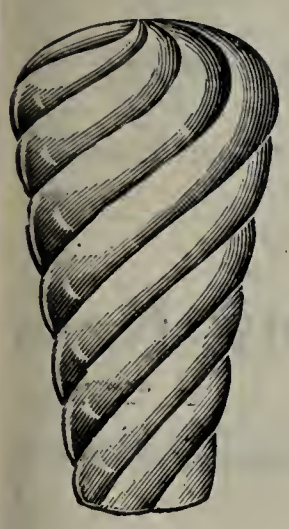
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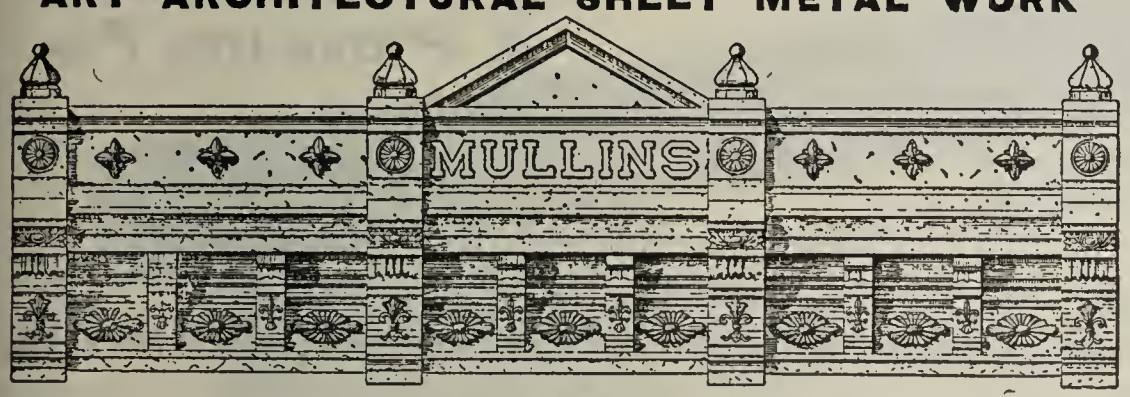
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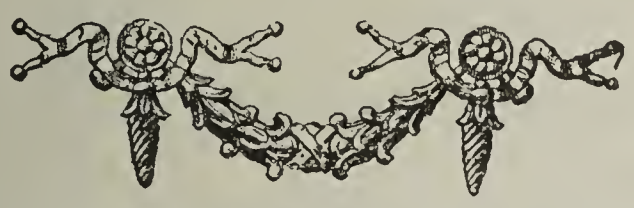
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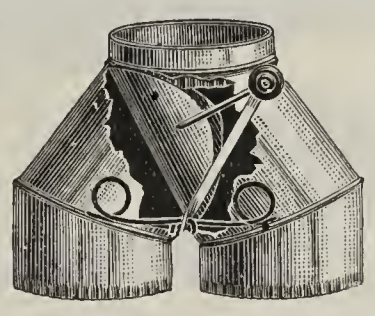
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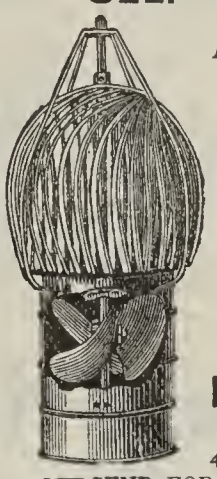
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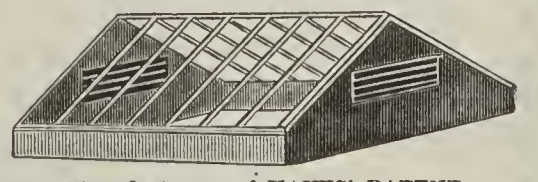
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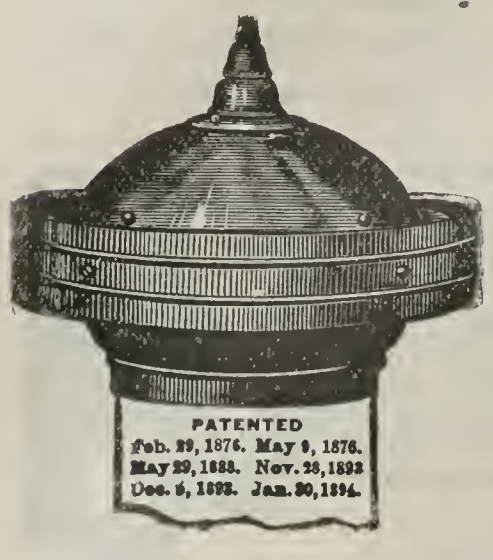
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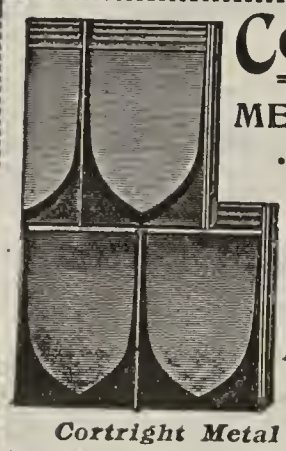
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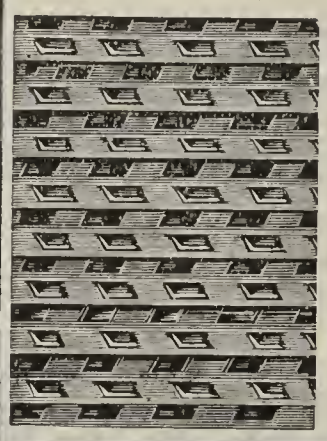
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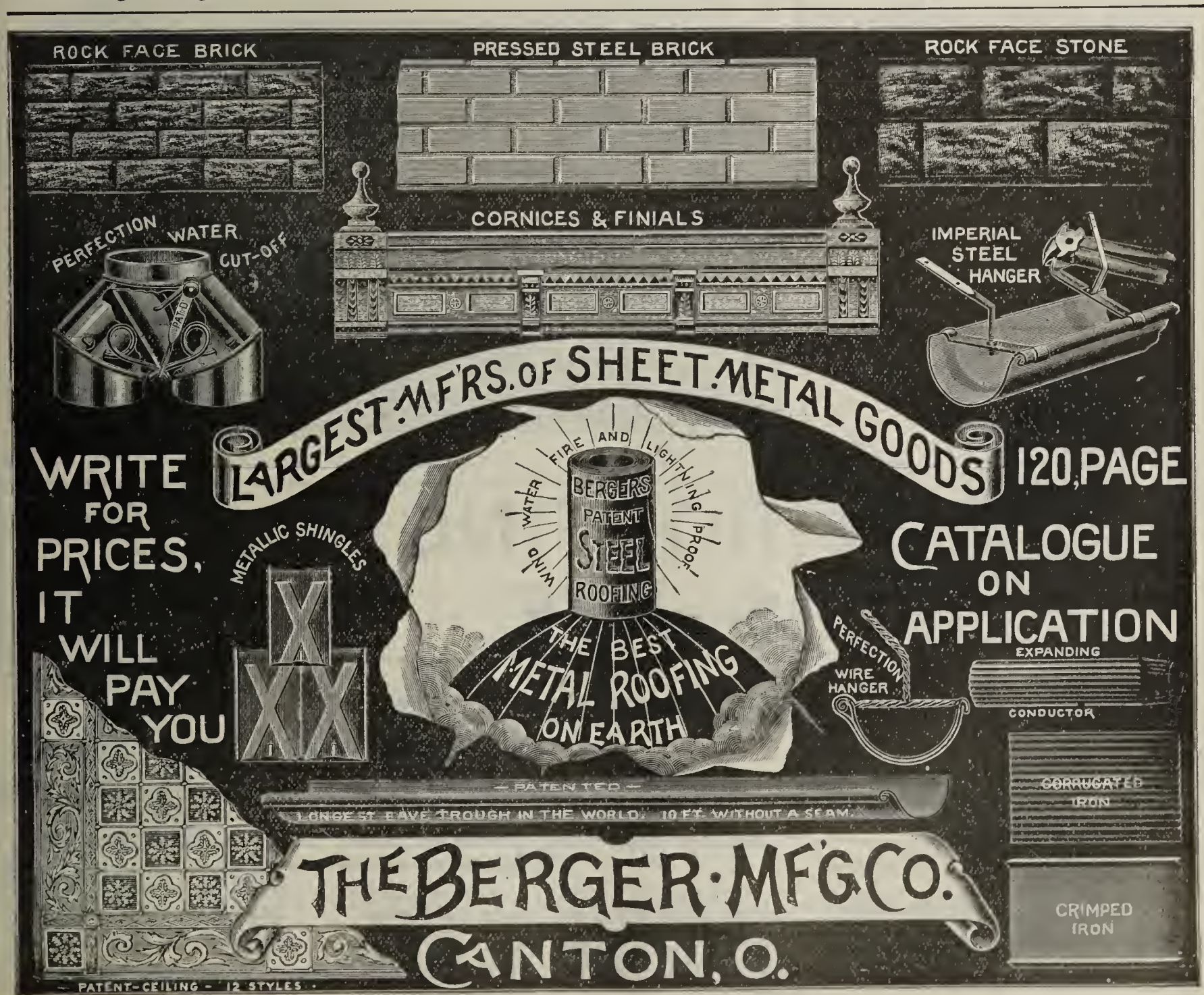
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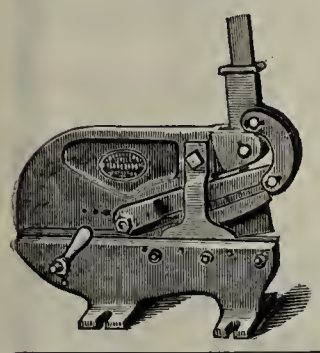
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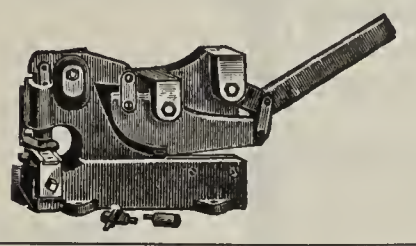
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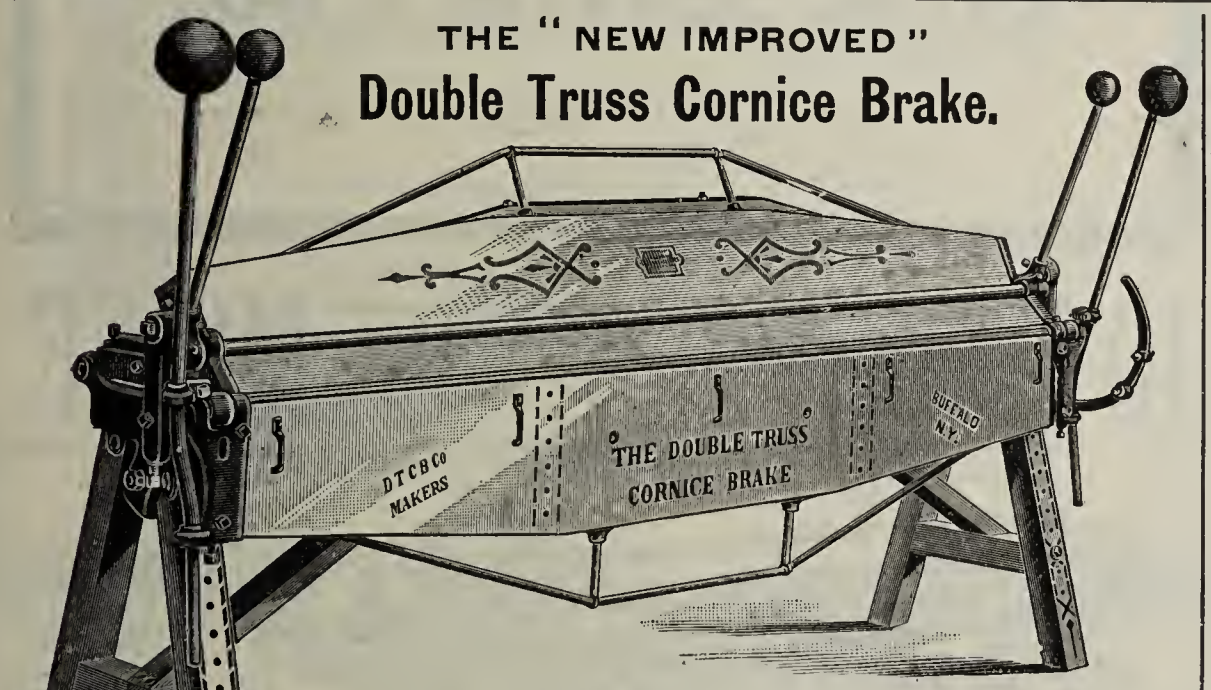
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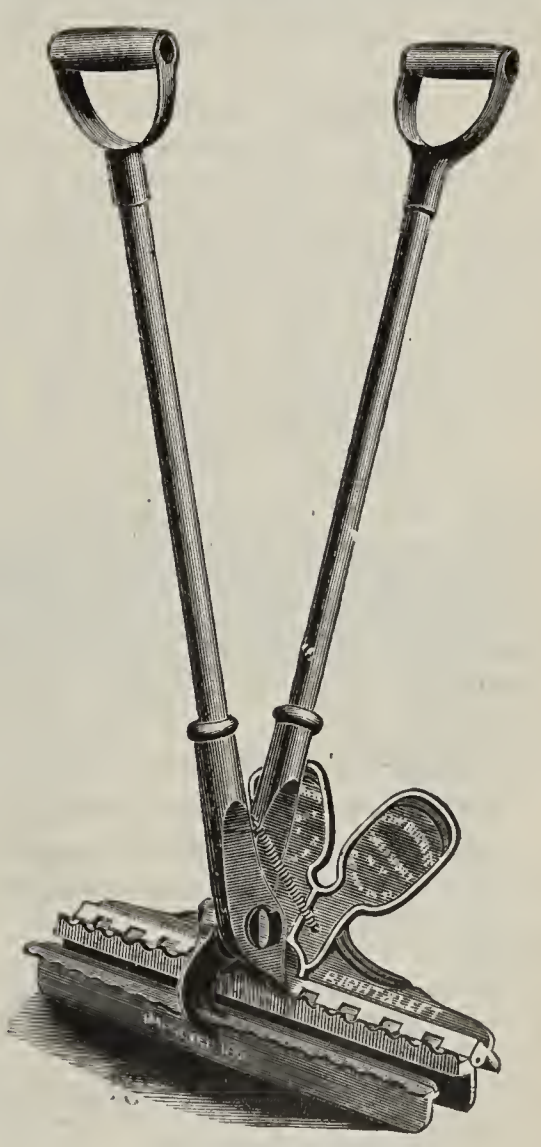
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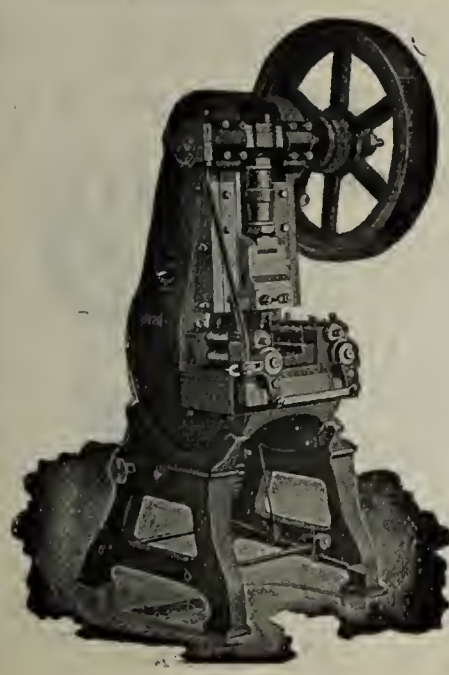
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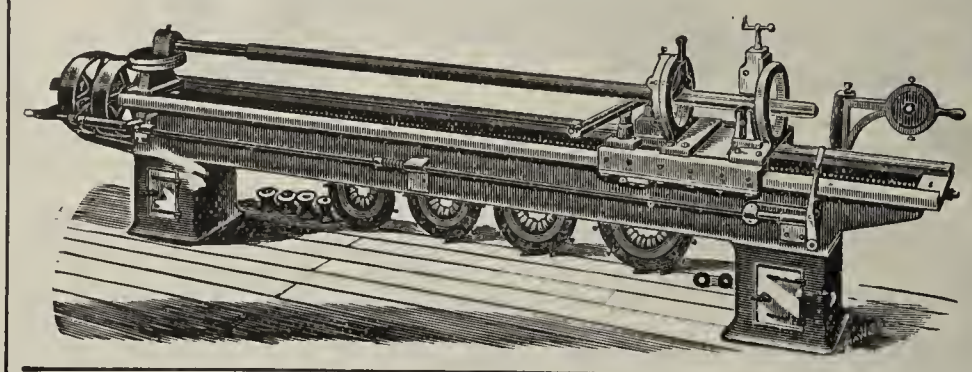
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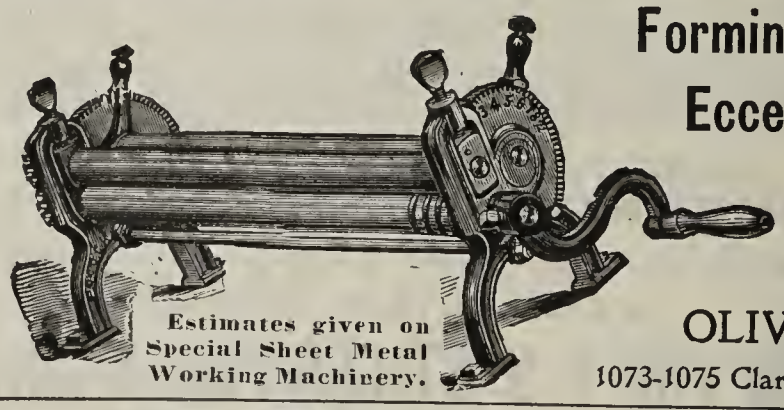
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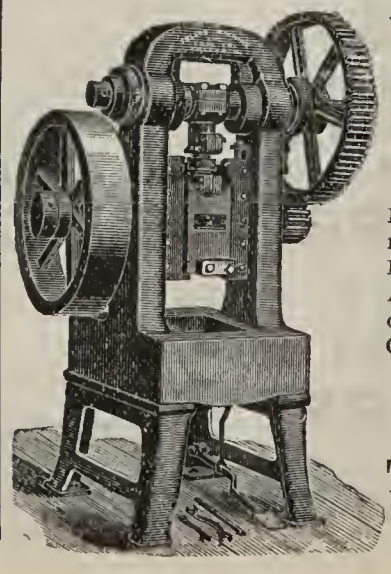
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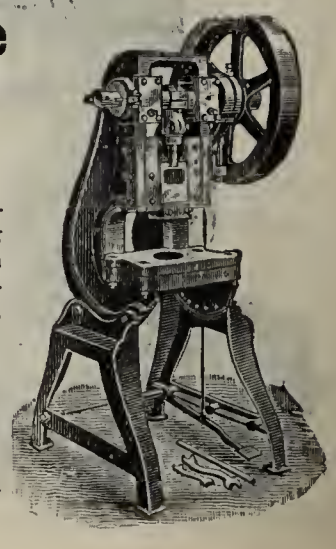
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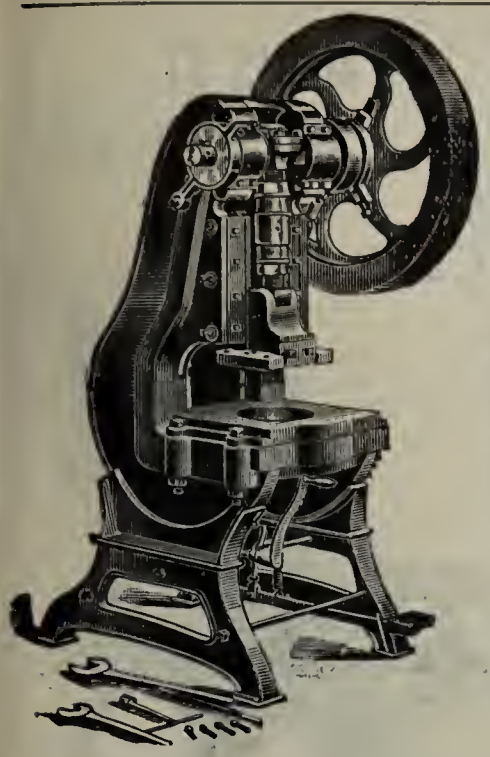
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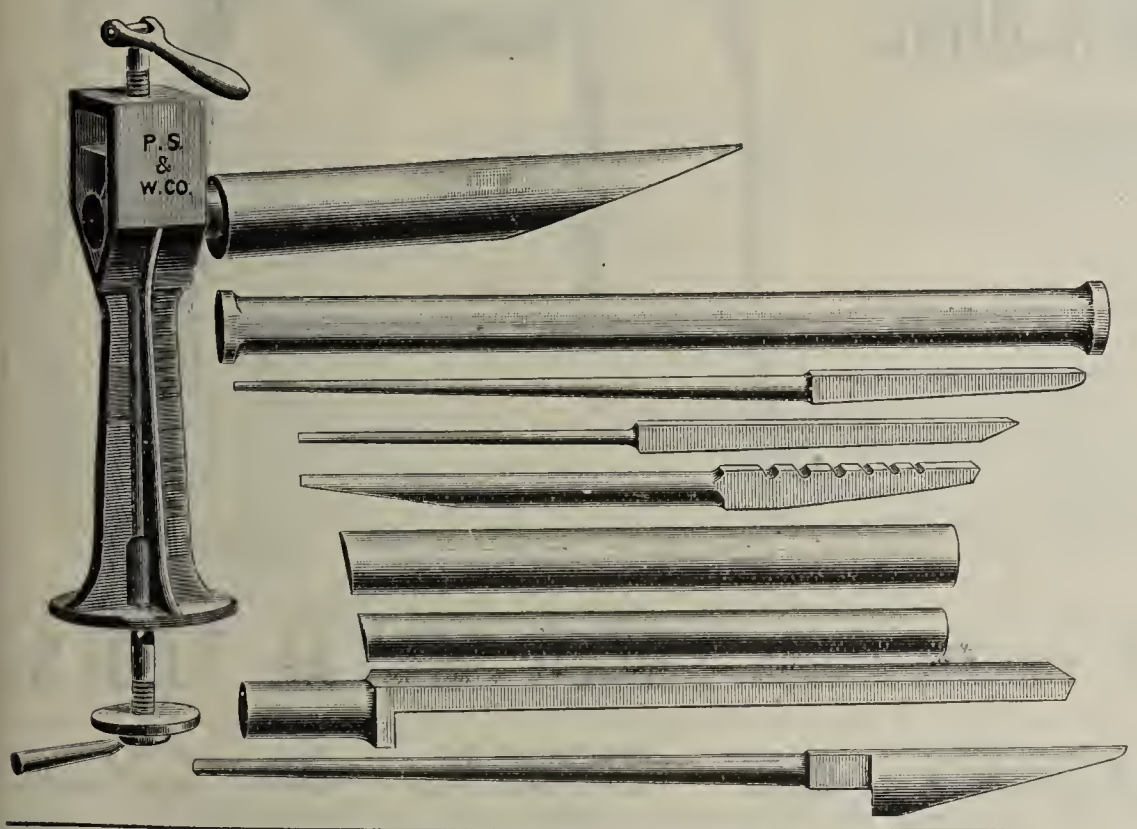
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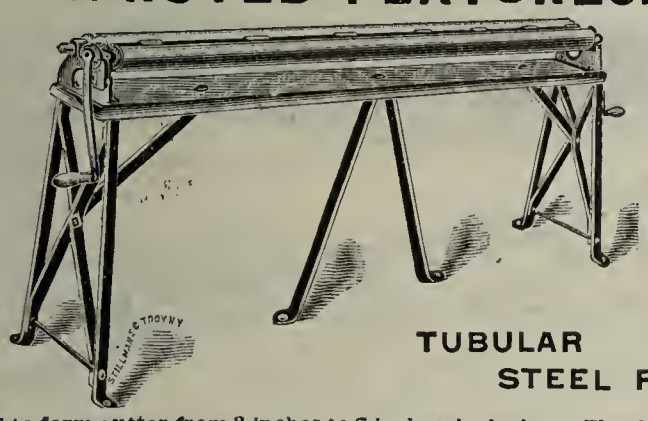
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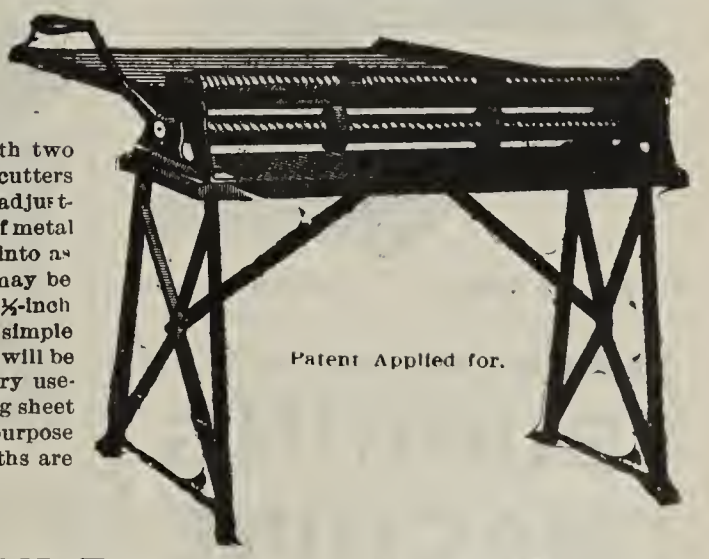
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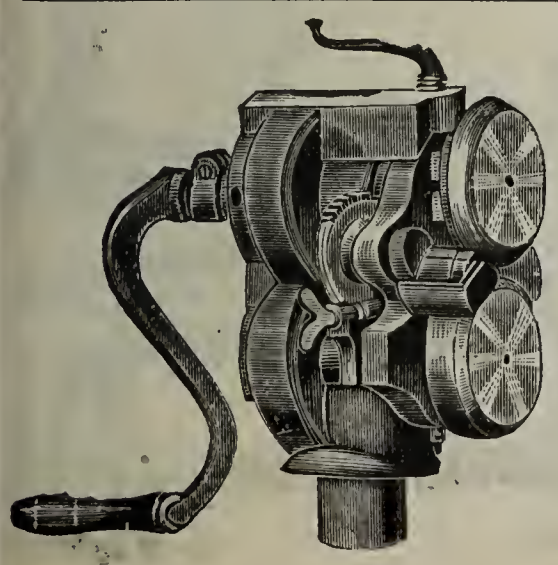


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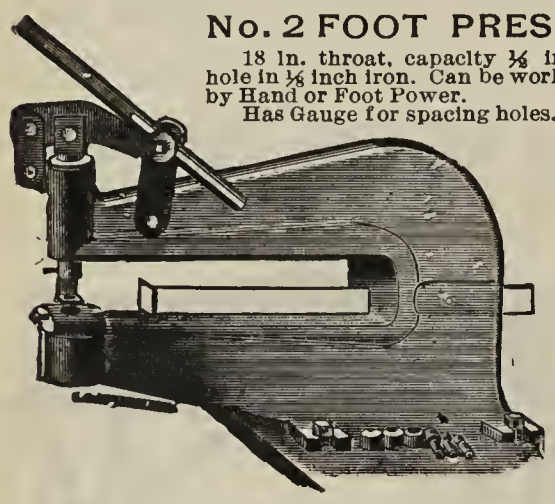
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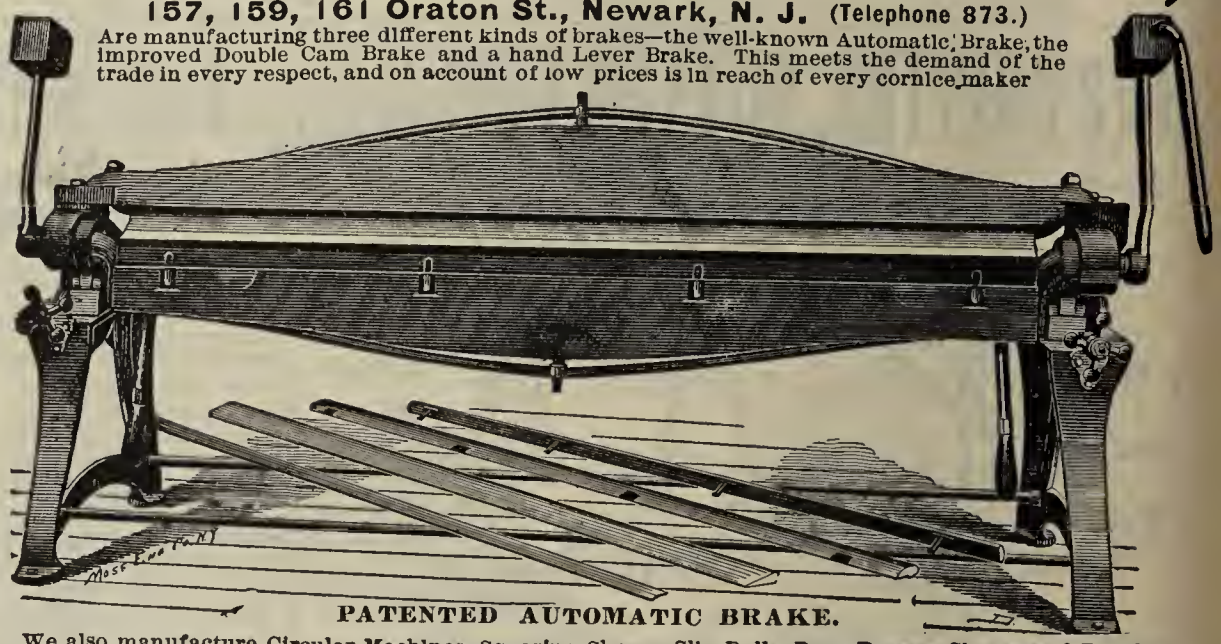
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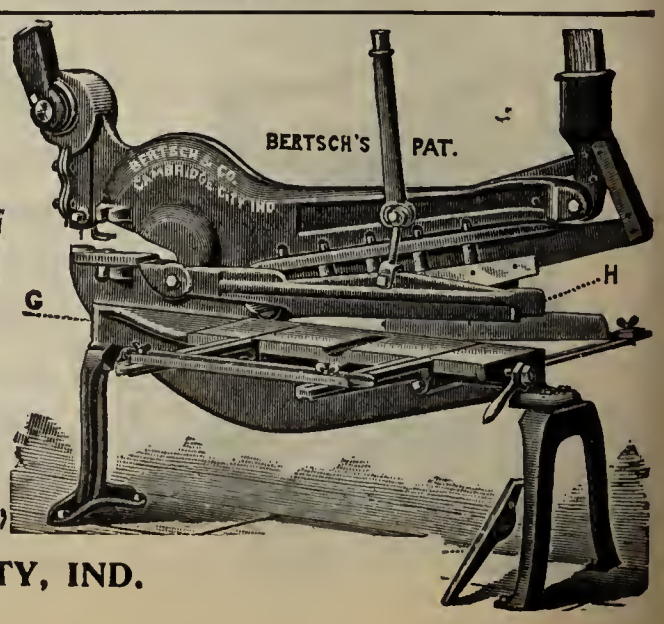
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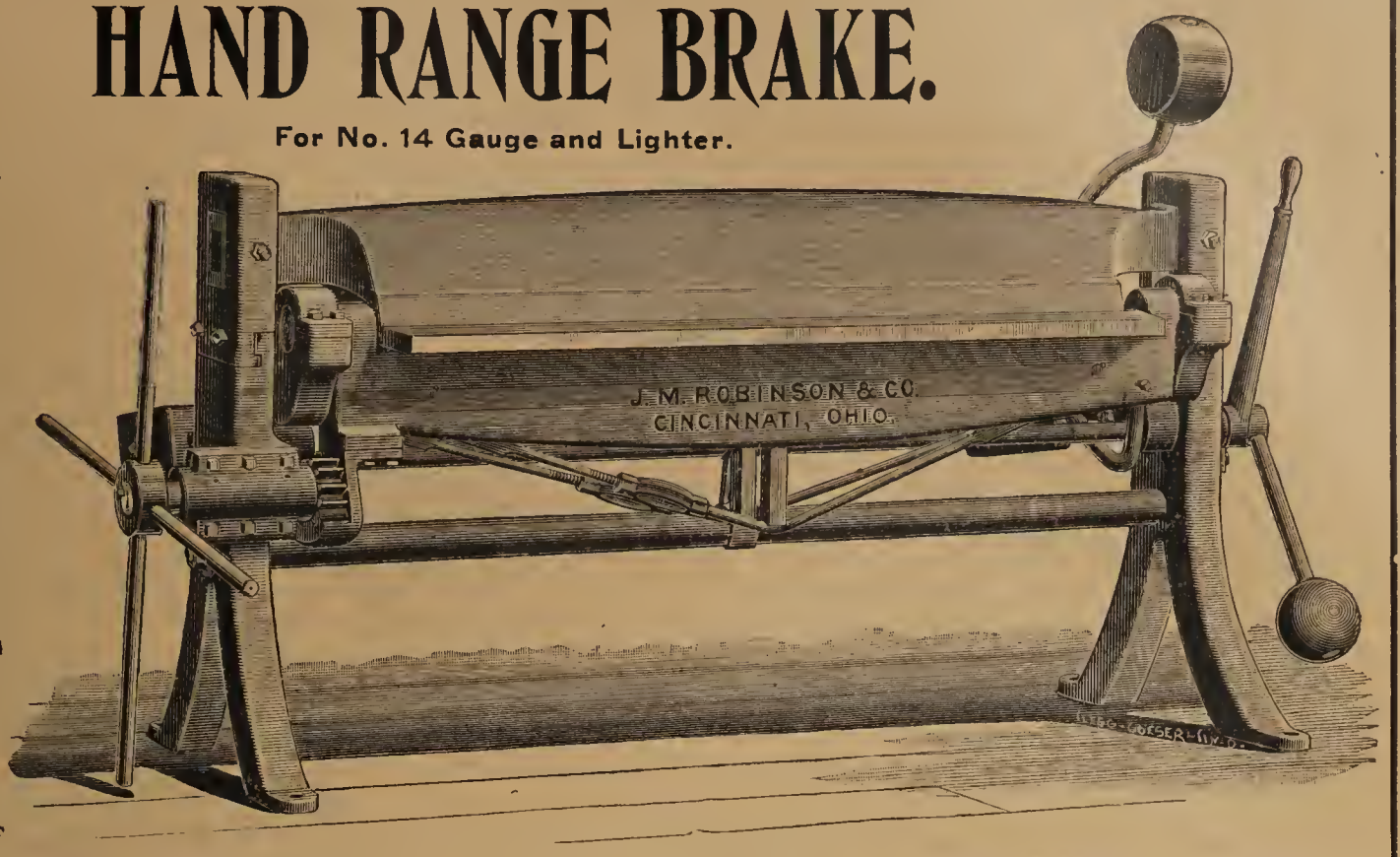
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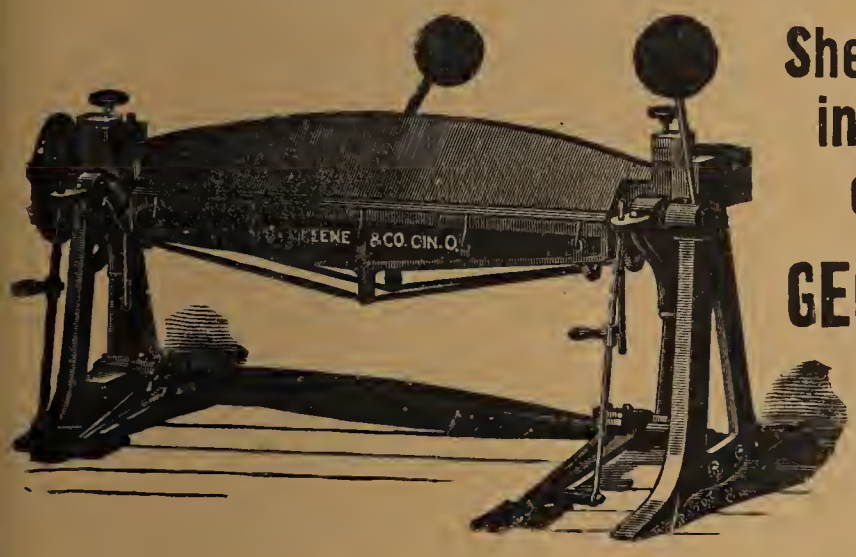
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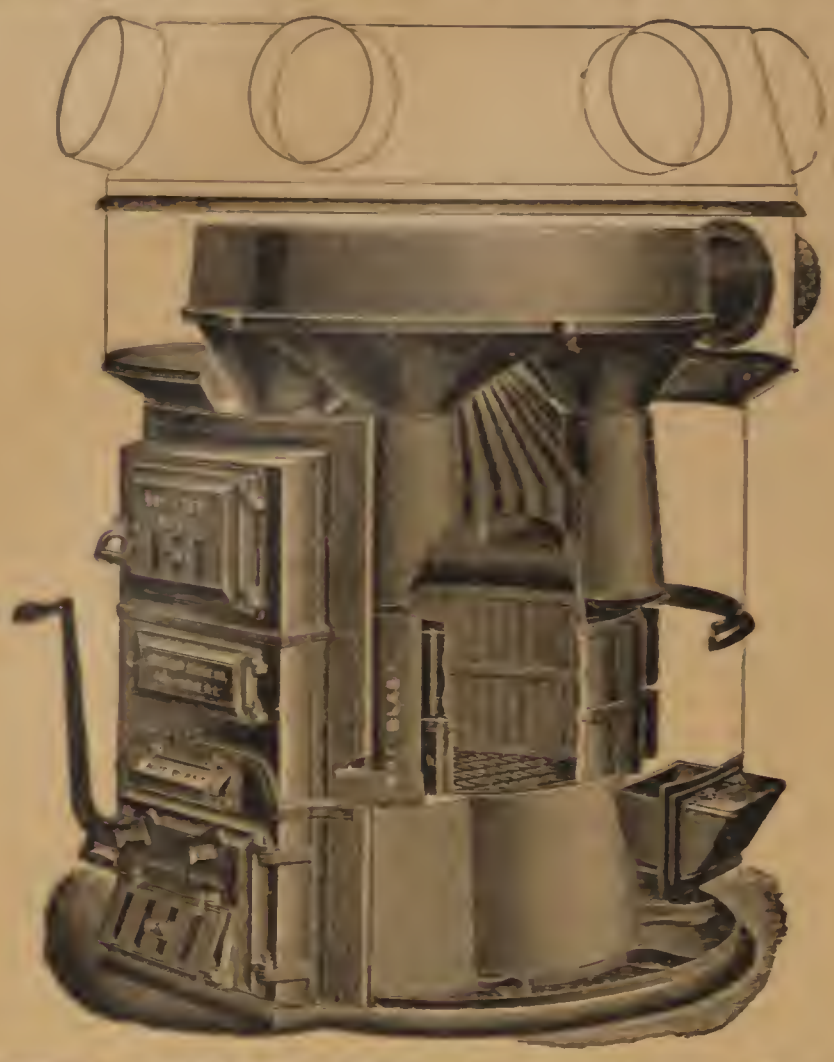
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TISSUE PAPER PACKED.

20 x 44	36 x 84
20 x 60	36 x 96
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28 x 66	42 x 96
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We solicit your orders.

N. & G. TAYLOR CO.,

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A BOOK OF LIGHT.

Free for the Asking.

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Telephone, 500 Franklin.

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Dunbar Foundry and Forge Irons.
Kemble Pig Iron.
Allentown Iron Co.
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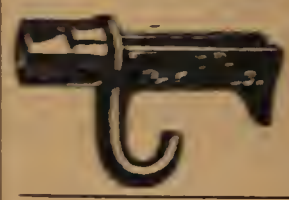
Dealers in all kinds of Scrap Iron and Steel.

BRUCE & COO

TINNERS'
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SUPPLIES

186, 188 & 190 Water Street,
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"WILLIS SAP SPOU



"In one piece, with hook. Made fr
"Tinned Malleable Iron. Will not bre
"Far superior to all others.

"SEND FOR CIRCULAR OF MAPLE SUGAR GOODS.

"CHARLES MILLAR & SON, Utica, N.



W. Dewees Wood Co. McKeesport, Pa
Sole Manufacturers of Wood's Smooth Iron
Patent Planished Sheet Iron.

Good Judgment

and Common Sense in a large degree is displayed by the stove dealer who refuses to deal in varieties and job lots, but wisely decides that whatever of money or talent he may have, it shall be expended to further the sale of ONE good reliable line, one sure to bring future business.

That man should handle the

GLENWOOD.

Write the Weir Stove Co., Taunton, Mass.

HEATER PIPE TIN.

We have the following sizes in stock:

IC & IX, 20 x 26, for 8 in. pipe.
IC & IX, 20 x 29½, " 9 in. "
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IX, 20 x 39, " 12 in. "
"Cupola" Brand.

Superior quality and finish. We invite correspondence before buying.

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PHILADELPHIA, PITTSBURG, PA.,
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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

VOL. LIX. No. 6. NEW YORK AND CHICAGO, FEBRUARY 5, 1898. ONE DOLLAR A YEAR. SINGLE COPIES, 5 Cents.

AMERICAN SEAL

STOVE PUTTY.
FURNACE CEMENT.
ELASTIC OIL
ROOFING CEMENT.
ROOFING PAINT.

PUT UP ESPECIALLY FOR JOBBING TRADE.
WILLIAM CONNORS, Troy, N. Y.

The "Gorton Side-Feed" Boilers
WILL BURN HARD OR SOFT COAL.
You Want the Best. We Have It.
SEND FOR CATALOGUE AND INVESTIGATE FOR YOURSELF.
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EASTWOOD VALVE.
EASTWOOD WIRE MFG. CO., - Belleville, N. J.

$ A FAMILY MUST LIVE $

with a furnace or a range every day. The sweetest temper and the soundest philosophy are not proof against a furnace that errs, or a range that disappoints. No man is perfect, but all men want perfect things

The furnace that never errs is the Paragon.
The range that always satisfies is the Excelsior.
There is money in them both for you.

ISAAC A. SHEPPARD & CO., PHILADELPHIA AND BALTIMORE.

VANDERGRIFT APOLLO IRON & STEEL COMPANY BEST BLOOM PITTSBURGH

NO HALF MADE APOLLO

anized iron.

certain Mill represents, we are told, that its ts are made by us and only dipped by itself; that ron is, therefore, the same as ours.

What a silly lie it is!

Apollo Iron and Steel Company, Pittsburgh, Pa.

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We offer special lines of Lavatories, with Plain or Decorated Bowls, ranging in price from $ to $ to many times these sums, and we particularly desire correspondence with buyers who wish a serviceable and modern combination at a reasonable price. Inquiries for any description of Tinners' or Plumbers' Supplies will meet with careful consideration

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WILLIAMS STOVE LINING CO.,
TAUNTON, MASS., Manufacturers of FIRE BRICK LININGS.

Back Pressure Valves.

Pressure Regulating Valves, Radiator Valves, Steam Traps, Pump Governors, Water Seal Automatic Air Valves
JUDSON A. GOODRICH CO.,
120 BEEKMAN ST. - - NEW YORK.

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m and Water Water Arches,
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LEY, 9-17 W. 13th St., NEW YORK.

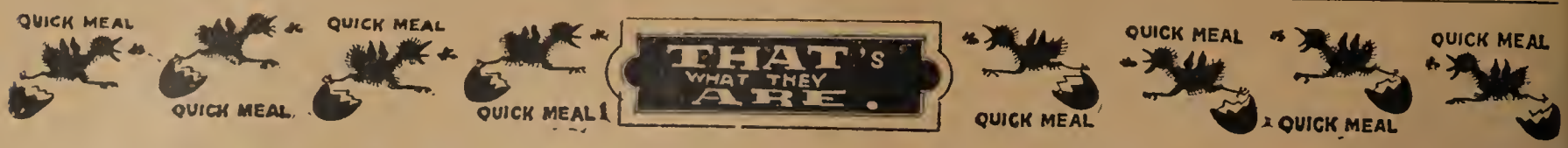


WE CLAIM THE FOLLOWING MERITS FOR JENKINS BROS.' VALVES.

1. Manufactured of the best Steam Metal.
2. No restricting, therefore not constantly wearing out the seat of the Valves.
3. Contain JENKINS DISC, which is suitable for all Pressures of Steam, Oil and Acids.
4. The Easiest Repaired, and all parts Interchangeable
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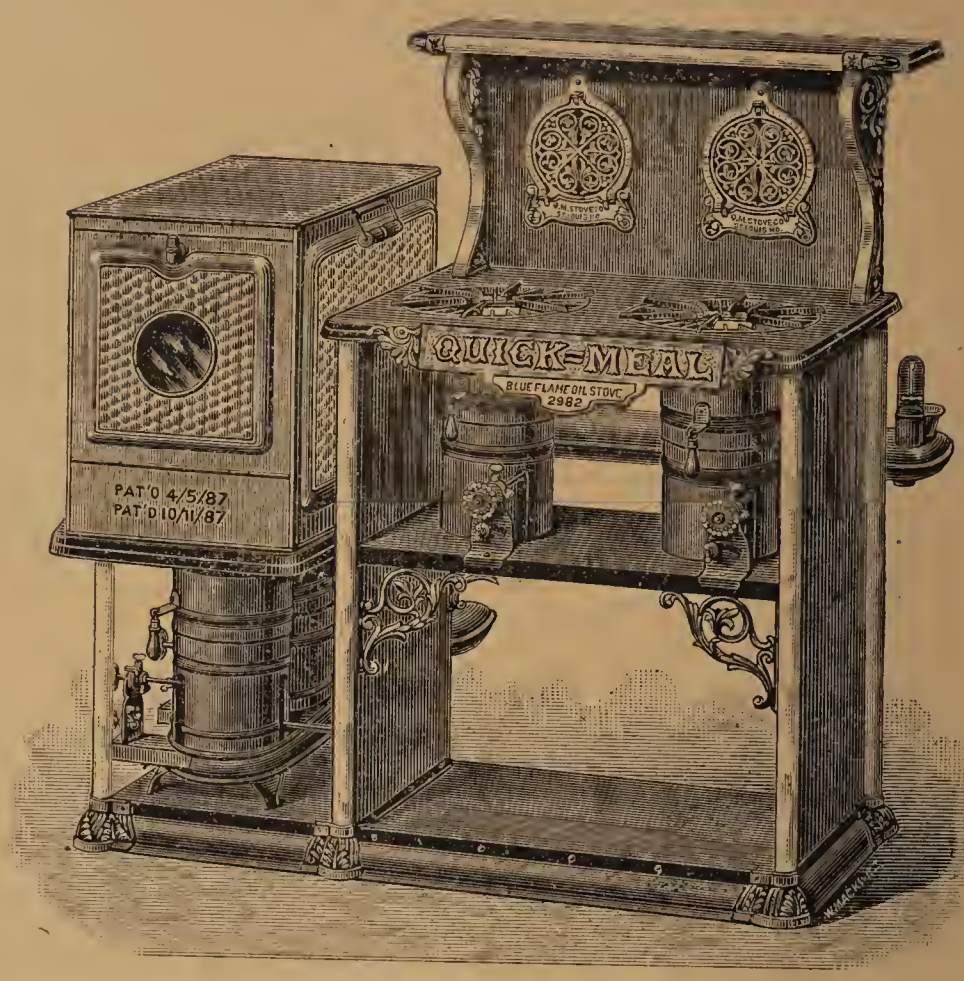
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THE MAGEE CATALOGUE
MAGEE FURNACE CO., Boston, Mass.



QUICK MEAL

BLUE FLAME OIL STOVES.



15 POINTS OF SUPERIORITY OF THE "QUICK MEAL" BLUE FLAME OIL STOVES.

1. The "Quick Meal" lights quicker and its flame is ready for duty quicker than any other stove.

2. The "Quick Meal" Brass Tank is composed of only **two pieces**. These two pieces are jointed together by a **single seam**, and that single seam **is absolutely tight**, because it is made on a machine specially built to do this work only. **It is leak proof.**

3. The "Quick Meal" has perforated cylinders which can be removed easily and instantly by withdrawing two bolts and replaced at a nominal cost.

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5. The "Quick Meal" has the perforations in its cylinders made by a special die, which leaves them smooth all over and easy to clean.

TO BE CONTINUED IN NEXT ISSUE.

"Quick Meal Steel Ranges" are "Quick" selling Ranges. They satisfy. That's what they are.

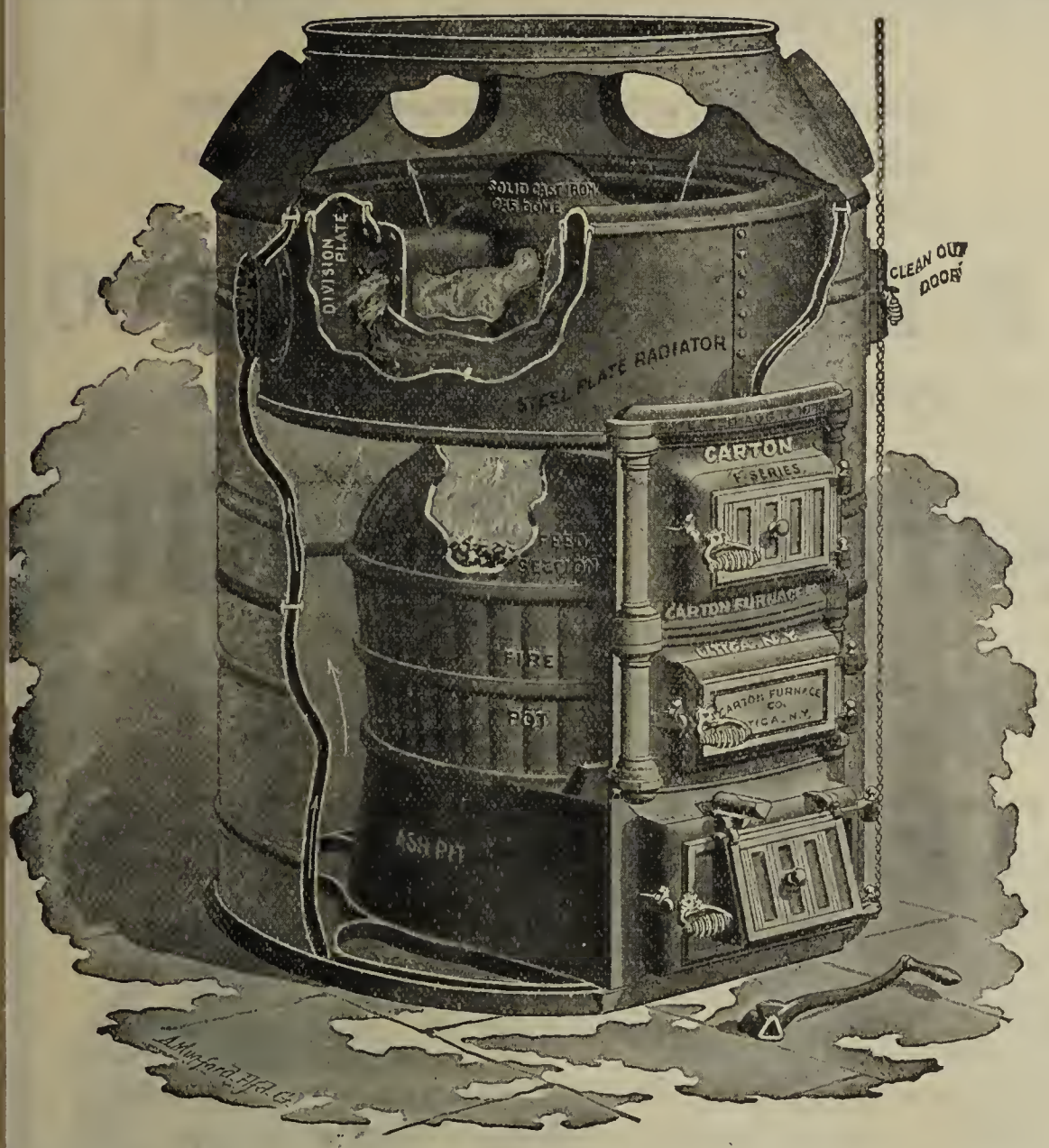
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Carton

Hot Water & Steam Boilers & Furnaces.

OUR NEW

Carton "F" Series.



GAS DOME

All CAST iron and large GAS MIXING Chamber.

CUP JOINT

Gas-Tight RADIATOR.



SUPERIOR construction.
ELEGANT shield FRONT.

SEND FOR OUR GOLDEN JUBILEE FURNACE CATALOGUE==
1847=1898.

Interested in Steam and Water Boilers—we make a most complete line, and you should send for our New Boiler Catalogue and Prices.

CARTON FURNACE CO.,

Makers of Heating Apparatus for the past *51 Years,*

UTICA, N. Y.

Warm Air Furnaces (Thirteen Patterns).

Combinations (Six Patterns).
Steel Tubular Steam Heaters.
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600 DEALERS SELL THESE HEATERS.

The Dealers Favorite Line

ECONOMY Heaters & Furnaces

FOR Hard Coal, Soft Coal, Lignite, Coke or Wood.

Before selecting a line of apparatus to sell in 1898 ask for our prices and Catalogue—we can interest you.

J. F. PEASE FURNACE CO.,

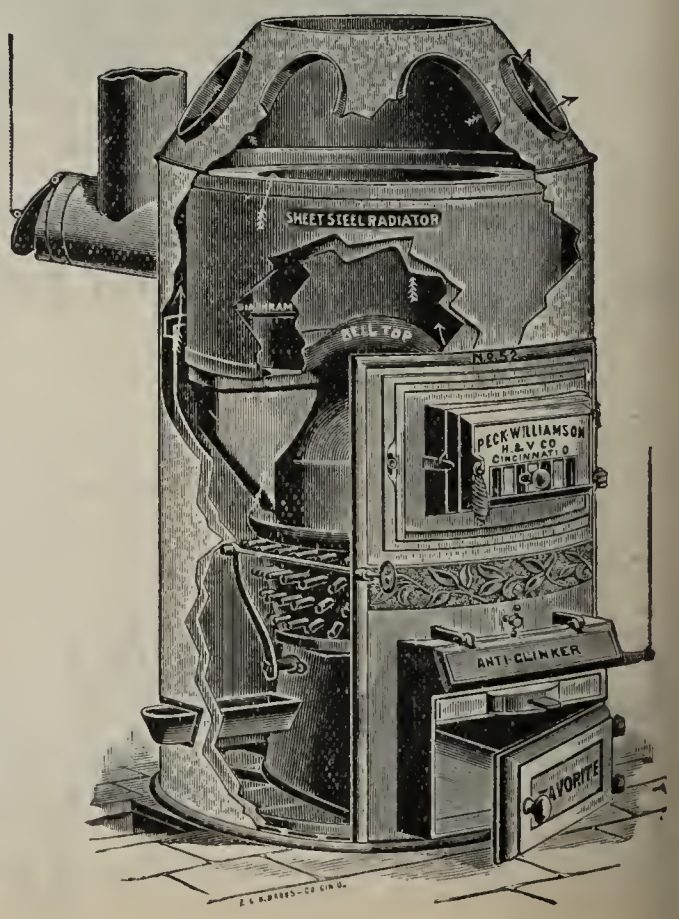
SYRACUSE, N. Y., and CHICAGO.

Surprising Results

are obtained by users of the

FAVORITE FURNACES.

The Favorite Furnaces are so recognized and endorsed everywhere because ***they are***. Our agents have never had to take one out or substitute another make. They are constructed on honor, and to use them is to attain that satisfaction in a heating apparatus so essential but difficult to obtain. Can't you place one or more in your vicinity? We ship same day order is received. There's money in it for you, Dealer.



The Peck-Williamson Heating & Ventilating Co.

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RUSSEL WHEELER & SON
Wheeler
TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.

THERE is money in the heating business if you only handle the right line of goods.

ENOUGH SAID, except that we think it would be to your advantage to investigate our line.

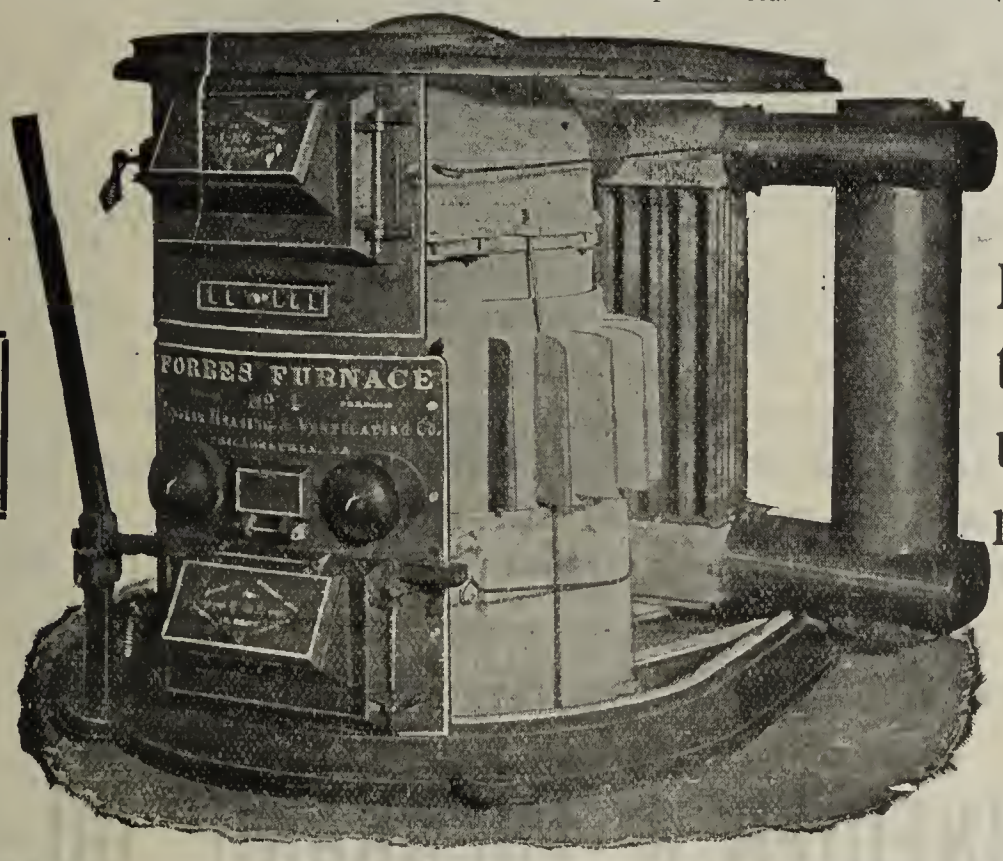
THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,
REAL ESTATE,
HATBORO, PA.

TUESDAY AND FRIDAY,
221 SOUTH FIFTH STREET,
PHILADELPHIA.

HATBORO, PA., Dec. 26th, 1896.

MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.
MY DEAR SIR :
In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal
Very truly,
I. N. EVANS.



SEND FOR CATALOGUE

COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

Only 4 ft. 3 in. High in the Largest Sizes.

LOW PRICE.

TUBULAR HEATING AND VENTILATING CO.,

228 QUARRY STREET, PHILADELPHIA.

DO NOT SPECULATE

IN

Cheap or Experimental

LINES OF

Vapor or Oil Cooking Stoves.



The average mortal has troubles enough of his own without buying those of his neighbor.

Speculation in any of the above mentioned lines will drain your purse and put you to a world of trouble.

Seeds of prudence now well sown in the selection of a line that is both complete and honest will yield a profitable and happy harvest. A good beginning for 1898 means half the battle won.

If you are interested in the handsomest line made, write for our catalogue.

EXCLUSIVE AGENCIES GIVEN.

THE SCHNEIDER & TRENKAMP CO.,

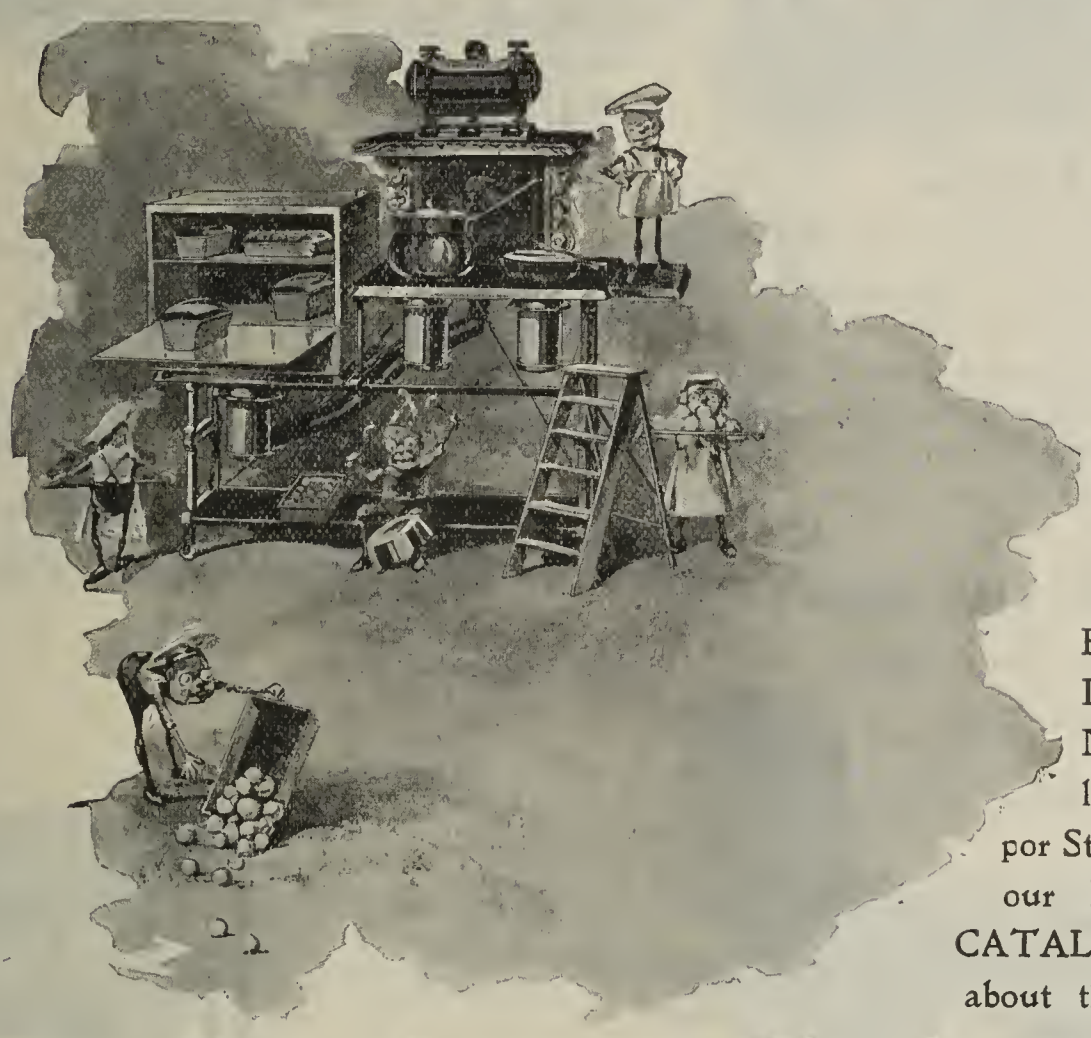
CHICAGO, ILLINOIS. CLEVELAND, OHIO.

COOK IN COMFORT

Monarch

"New Method," "Smokeless Giant Generator,"
"Smokeless Safety Junior," "Blue Flame Oil," "Asbestos Filled Oven"

Stoves



For 1898

Far exceed, in point of Design, Utility and Novel Features, any line of Oil, Gas or Vapor Stoves ever offered. Get our BEAUTIFUL NEW CATALOGUE and read all about them.

The Monarch Stove & Mfg. Co., Mansfield, Ohio.

BRANCH HOUSES:

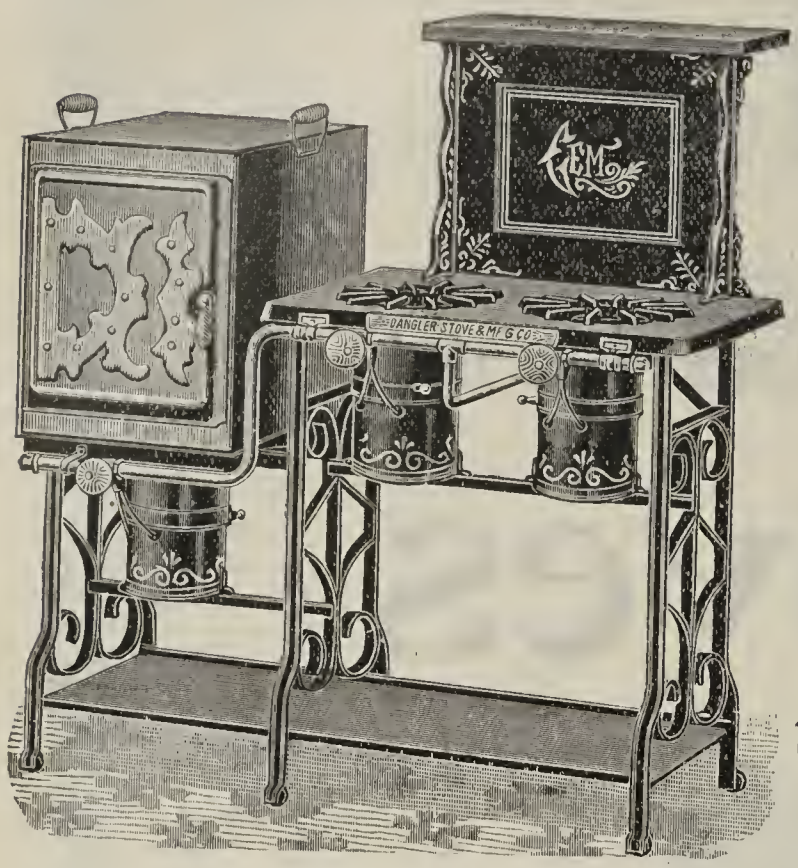
67 Lake St , Chicago. 284 Pearl St., New York City. 107 N. Second St., Philadelphia.
954 Penn Ave., Pittsburgh, Pa. 191 Eagle St., St. Paul, Minn. 12 W. 10th St., Kansas City, Mo.
Lincoln, Neb. H. Leonard & Sons, Grand Rapids, Mich. Kiechle, Brentano & Co., Evansville, Ind.

COOK IN COMFORT

BLUE FLAME OIL STOVE LEADERS

FOR 1898.

WE LEAD AND OTHERS FOLLOW.



For Durability and Simplicity our Blue Flame Wick and Wickless Stoves are recognized as the best in the market.



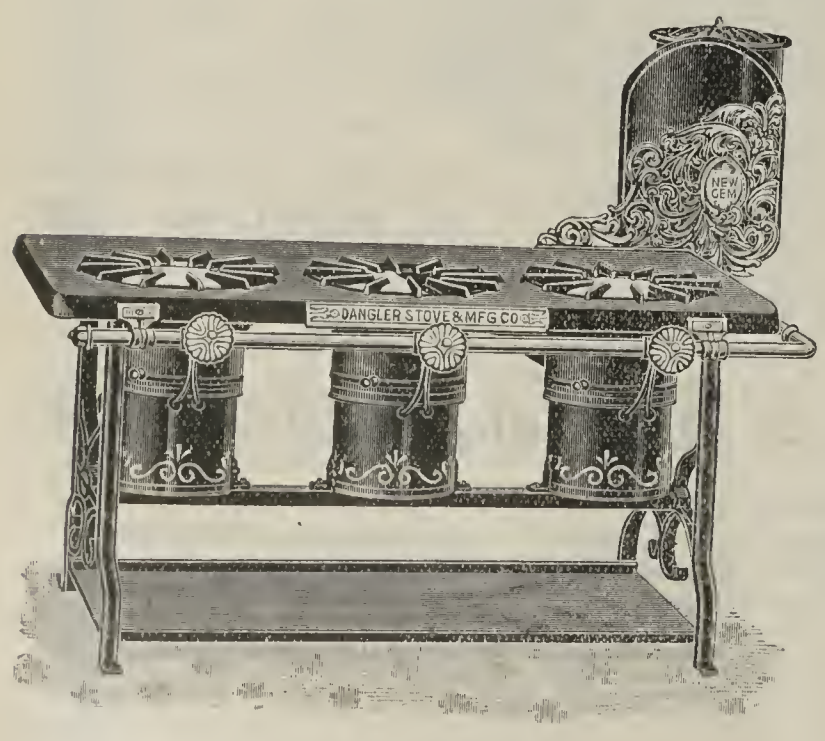
WICKLESS.

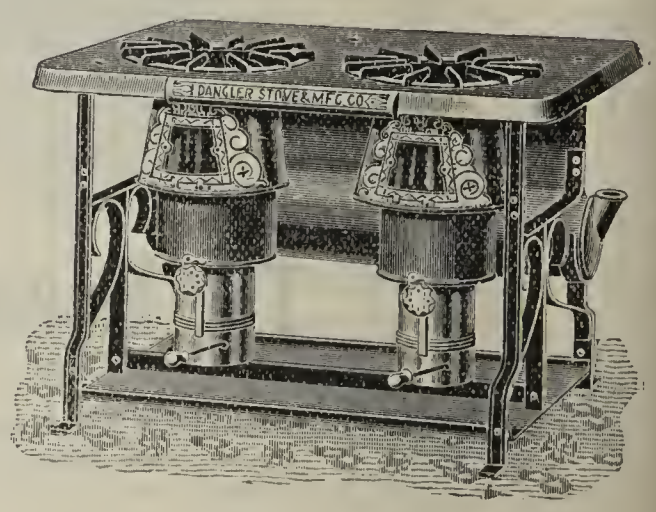
Made in seven different styles. Convenient in construction ; economical in the consumption of oil ; made with our Double Feed ; German Silver points ; no rusting or clogging ; with valve-stop and regulator ; heavy brass chimneys. Made for service and not for show. High back swinging shelf ; removable tank ; stove on rollers ; easy to operate and to clean.

A STOVE FOR THE PEOPLE.

WICK.

Our celebrated Blue Flame Wick Stoves are made in seven different styles, and are now in use in more than fifty thousand households in the United States, who bear willing testimony to their great merits. Artistic in design, handsome in appearance, and powerful in operation:





Our line of Gasoline, Vapor and Evaporating Ranges, Stoves, etc., as usual, is perfect and complete. Send for Catalogue.

THE DANGLER STOVE & MFG. CO., - Cleveland, Ohio.

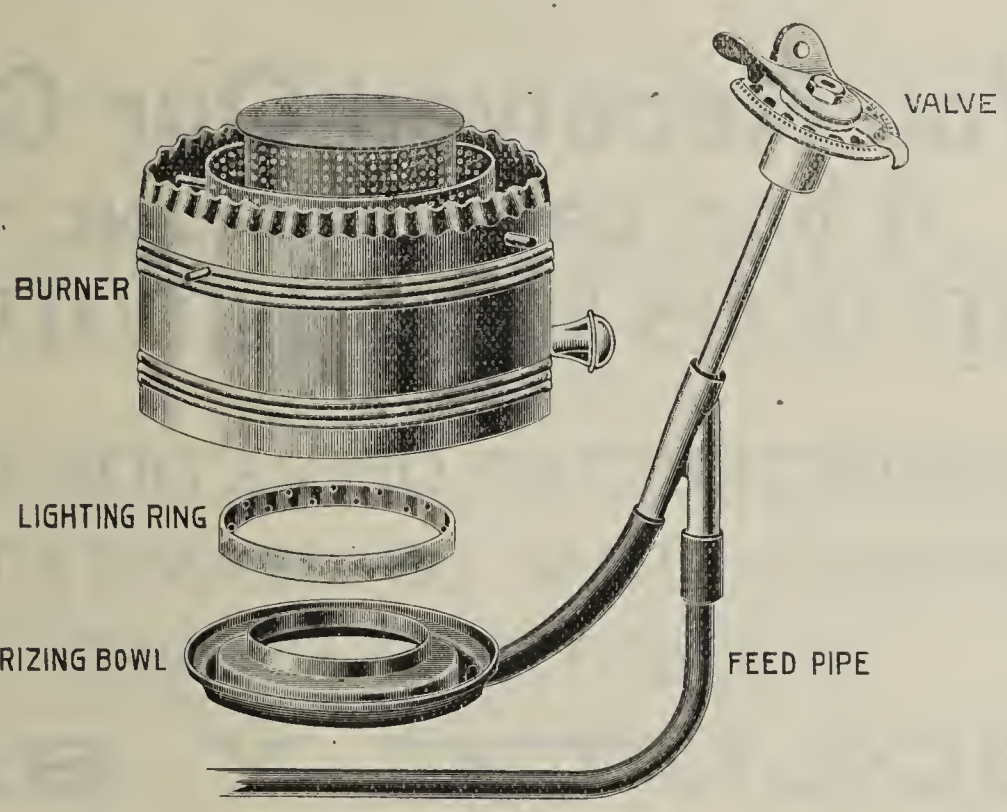
NO COMPETITION

For the Dealer
who handles

The Puritan=Wickless

Blue Flame Oil Cooking Stove,

BECAUSE IT HAS NO EQUAL.



This is all there is to it

aside from the Reservoir and Frame. *ONLY 3 PARTS* to the Burner. All simple. Nothing to get out of order.

The only stove ever made that will burn either coal oil (kerosene) or gasolene.

ABSOLUTELY SAFE. **FREE FROM ODOR.**

WRITE FOR CATALOGUE A.

MANUFACTURED BY

THE CLEVELAND FOUNDRY CO.,

CLEVELAND, O. BOSTON, MASS.

Lighted By Gas in 30 Seconds.



In Reality Gas Stoves.

Have You Received Our Catalog?

IF NOT, DROP US A LINE.

The Gasolene is THREE INCHES BELOW THE VALVE OUTLETS.

THE UNOBSTRUCTED OPERATION OF THE UNFAILING LAW OF GRAVITATION MAKES THESE STOVES

ABSOLUTELY SAFE.

We do not rely upon a float or any other mechanical device which may fail at any moment.

Odorless in Lighting. Odorless While Burning.



Odorless When Burners Are Turned Out.

GEORGE M. CLARK & COMPANY, 72-74-76 Lake Street, CHICAGO,

SOLE MANUFACTURERS.

Fuller & Warren Co.,

TROY, N. Y.

The numerous changes and additions recently made to our line of P. P. Stewart and Diamond ranges keep them "up to date" in every particular. Within a few days we shall mail to the trade a circular describing their special features. If you do not receive a copy write us. It is sure to interest you. We can furnish promptly anything from our extensive assortment of Furnaces, Water Heaters, Stoves and Ranges.

HART & CROUSE CO.

Royal Heaters.

ALL KINDS OF HEATING APPARATUS.

235 WATER ST., NEW YORK. UTICA, N.Y.

79 LAKE ST., CHICAGO. COLUMBUS, O.

ST. LOUIS, MO.

ROYAL HEATERS LEAD ALL OTHERS.

SOLD ON THEIR MERITS, NOT ON THEIR ANTIQUITY.

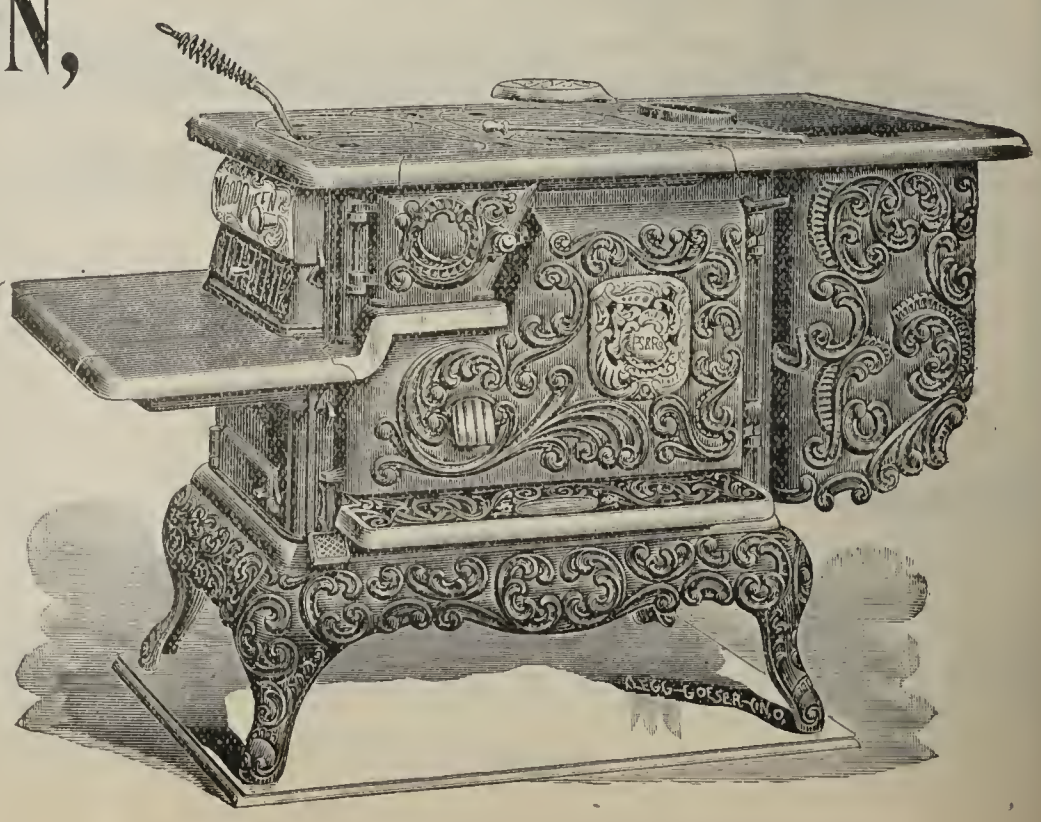
THE MOSTEST GOODS FOR THE LEASTEST MONEY. . .

The Stove is "all right" and we can prove it to you by sending you a sample. It is ***"Lansing"*** the trade of our contemporaries and orders are pouring into the ***"Grand Haven,"*** where we take care of them promptly.

THE WOOD QUEEN,

WITH BRACKET RESERVOIR,

is a great big well made wood stove that is beautiful in design and modern in every respect. We have the first time to place a sample that has not brought in a nice order. Send for prices and secure the agency for your town.



The Portsmouth Stove & Range Co.,

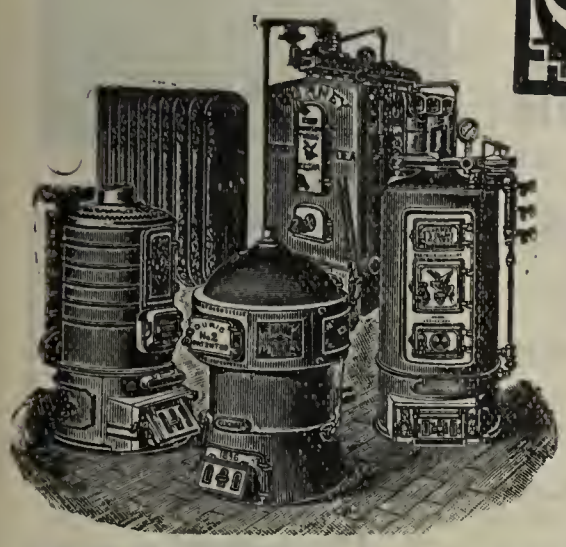
Busiest makers of Stoves and Ranges in the world,

Portsmouth, Ohio.

1898

Gurney

1898

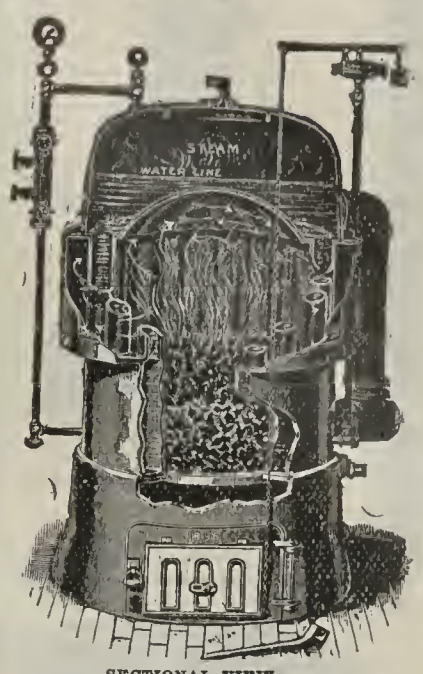


Hot Water Heaters,
Steam Boilers and Radiators.
THE STANDARD OF THE WORLD.
SEND FOR LATEST TRADE CATALOGUE.

SOLD ONLY THROUGH THE TRADE.

GURNEY HEATER MFG. CO.,
163 Franklin St., Cor. Congress,
BOSTON, MASS.
New York City Branch, 48 Centre Street.

CAPACITIES TO MEET ANY
...REQUIREMENT...



SECTIONAL VIEW.
DORIC SEAMLESS TUBULAR STEAM BOILER.

KEEP YOUR I ON

The **Plummer Heaters.**

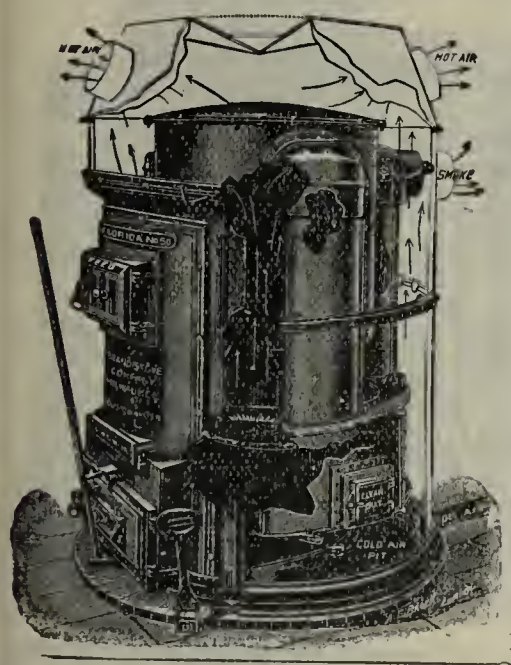
THE PLUMMER BRICK SET **STEAM HEATER,** NEW MODEL.

THE **LEADER** HOT WATER HEATER.

Made in our own plant. Send for Catalogue.

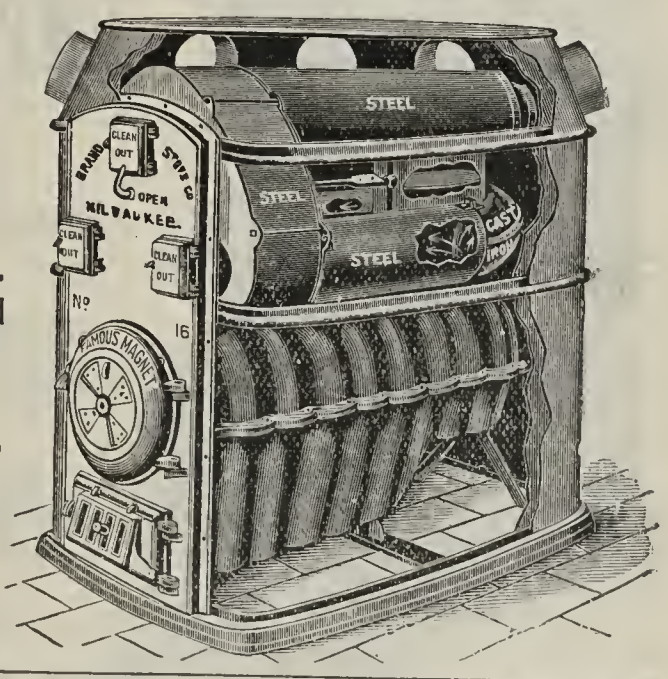
THE PUTNAM FOUNDRY & MACHINE CO., - Putnam, Conn.

THE FAMOUS FLORIDA.
FOR COAL.



Brand's Famous Furnaces.

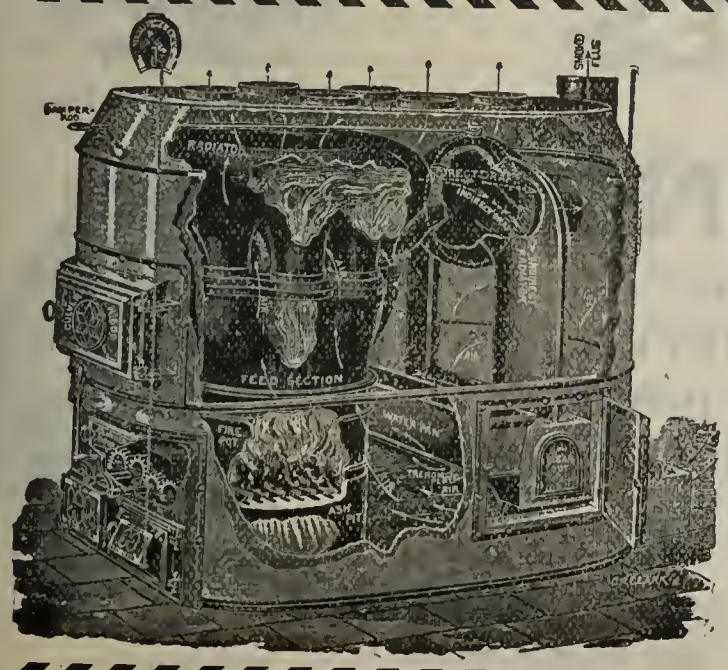
THE FAMOUS MAGNET.
FOR WOOD.



Revertible Flues.
Extra Large Radiator.
Heavy Fire Pot.
Revolving or Flat Grates.
Very Large Ash Pit Door.
Spacious Ash Pit.
Gas and Dust Proof.
Efficiency in Heating.
Large Radiating Surface.
Easy Access to Radiator.
Durability Unsurpassed
Made in 3 Sizes.
38-50-60 Inch Fire Boxes.

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BRAND STOVE CO.,
MILWAUKEE. CHICAGO.



THE SIMONDS FURNACE CO.,

SUCCESSORS TO THE SIMONDS MANUFACTURING CO.,
No. 50 CLIFF ST., NEW YORK,
Manufacturers of the Celebrated

"CULVER AND MONTANA FURNACES."

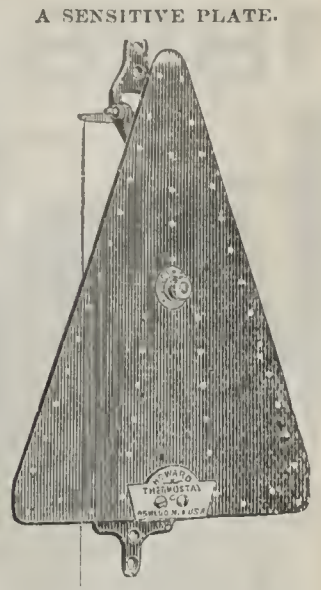
Double and Single Oven Ranges, with special features and latest designs.

STEAM AND HOT WATER BOILERS.

Our new Elliptic Furnace has unequaled radiating surface and is sure to give satisfaction.

Send for Catalogues and Prices.

THE THERMOSTAT,
A SENSITIVE PLATE.



TO HEATER DRAFTS OVER PULLEYS.

HOWARD AUTO MATIC DRAFT REGULATOR

SAVES ¼ OF THE **COAL.**

SAVES ¼ OF THE **LABOR.**

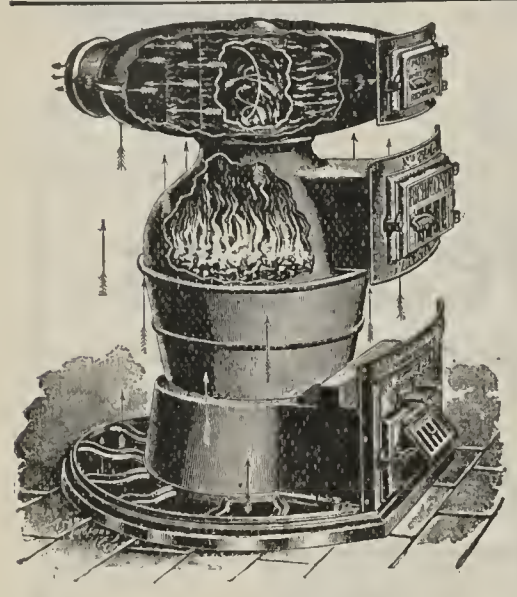
There are **OTHER REASONS** why you should use and recommend IT. Send your name and address, and let us explain. No matter which heater you "talk" there is but one HOWARD THERMOSTAT.

USED ON HOT AIR FURNACES. HOT WATER HEATERS. STEAM BOILERS. STOVES AND INCUBATORS.

Get Prices.

MADE BY
HOWARD THERMOSTAT CO.,
OSWEGO, N. Y.

1/4 OFF.



The Richmond Stove Company

make all kinds of

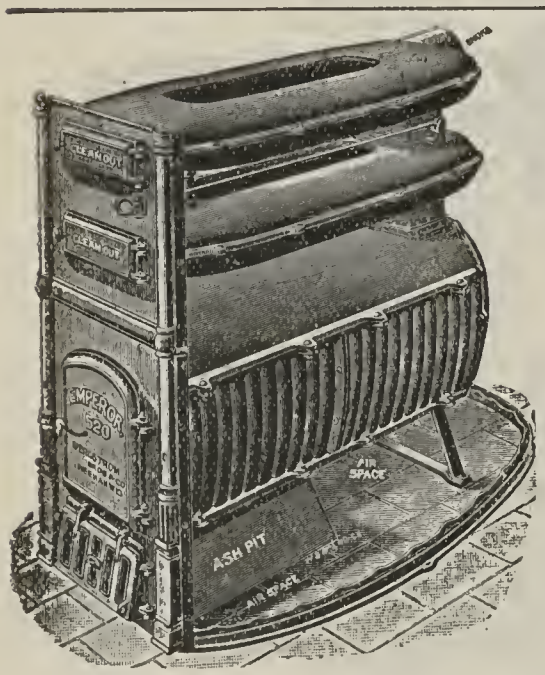
HEATING AND COOKING APPARATUS.

The name **RICHMOND**

is a guarantee of excellence and reliability.

NEW YORK OFFICE:
85 Centre Street.

Works:
NORWICH, CONN.



EMPEROR FURNACES

FOR WOOD.

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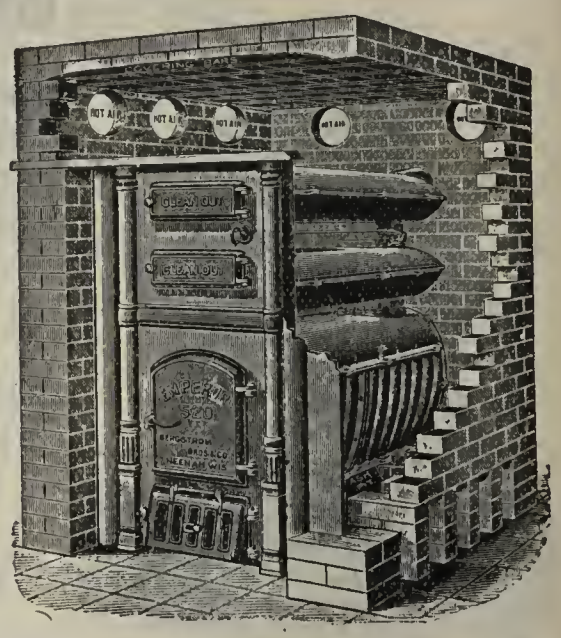
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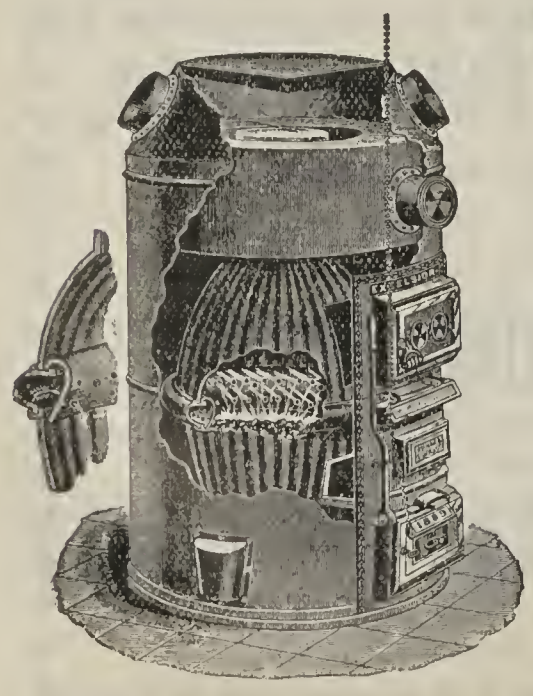
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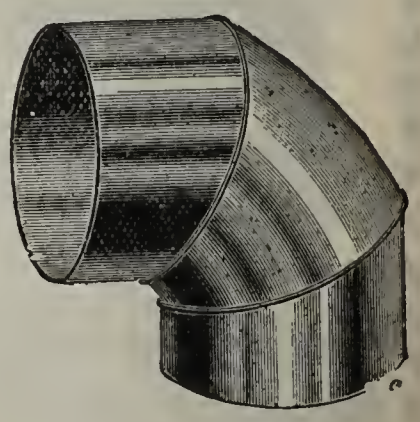
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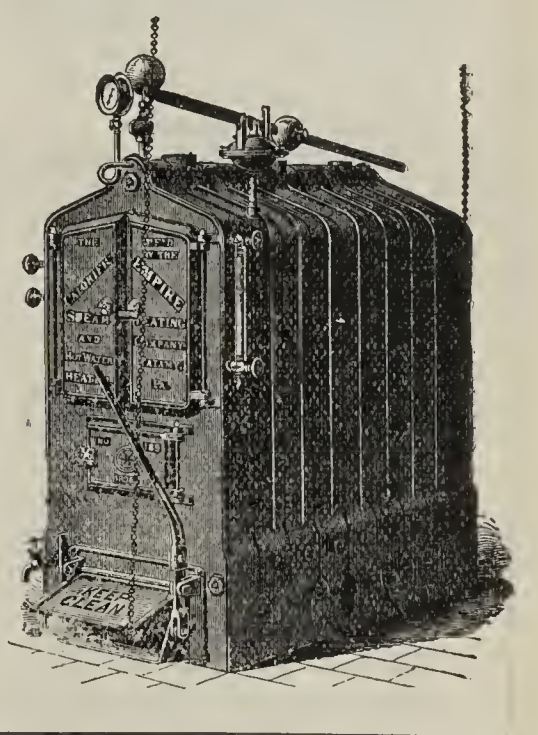
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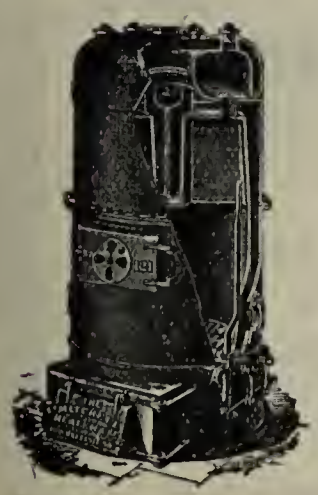
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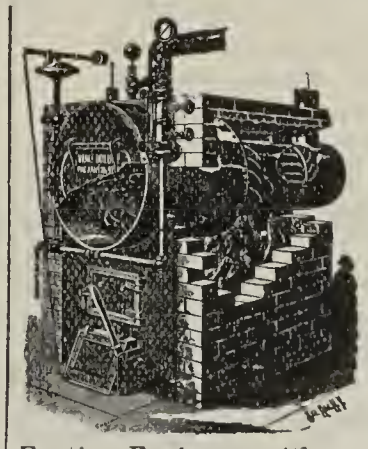
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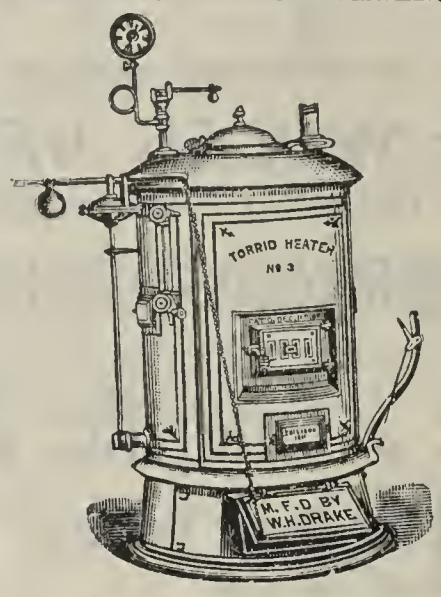
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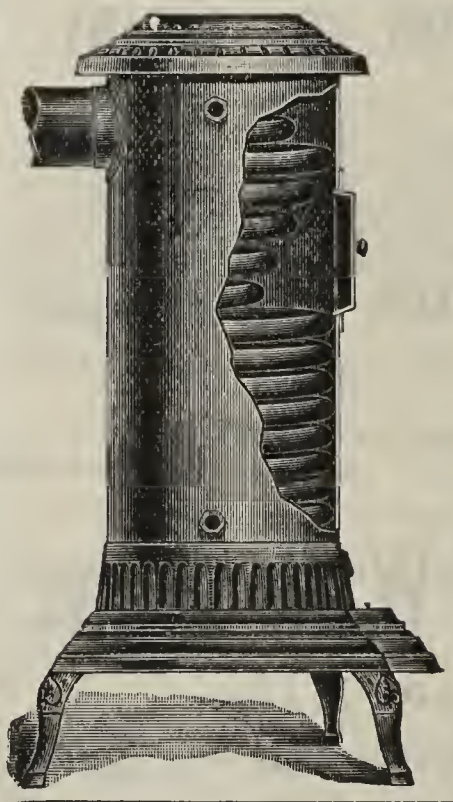
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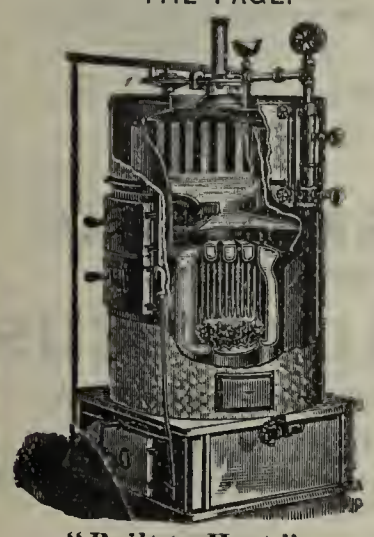
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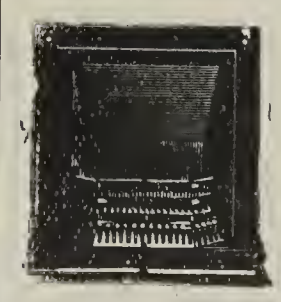


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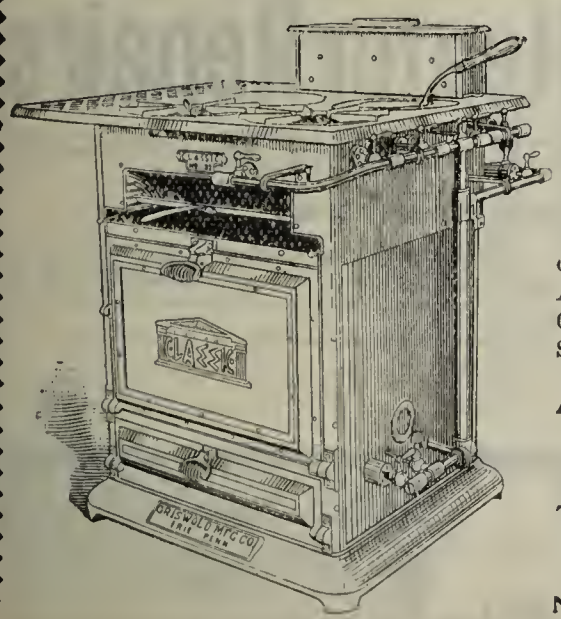
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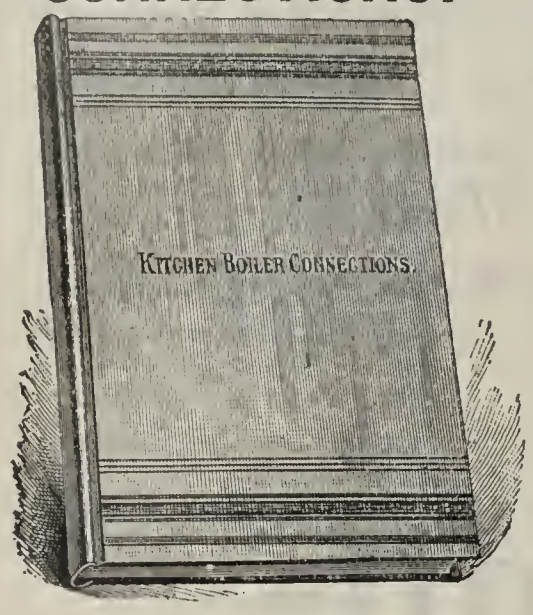
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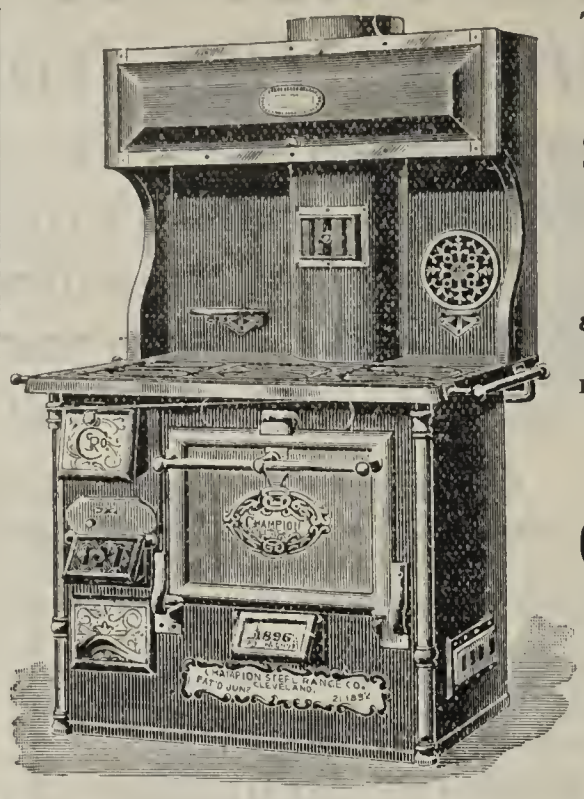
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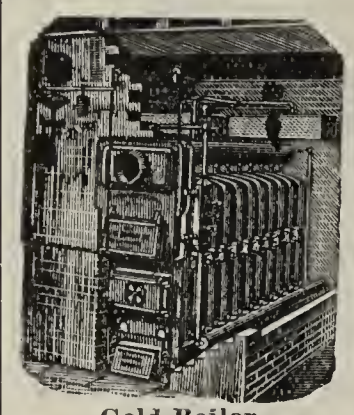
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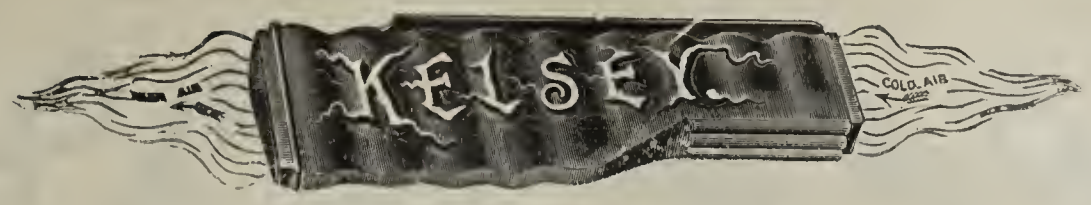
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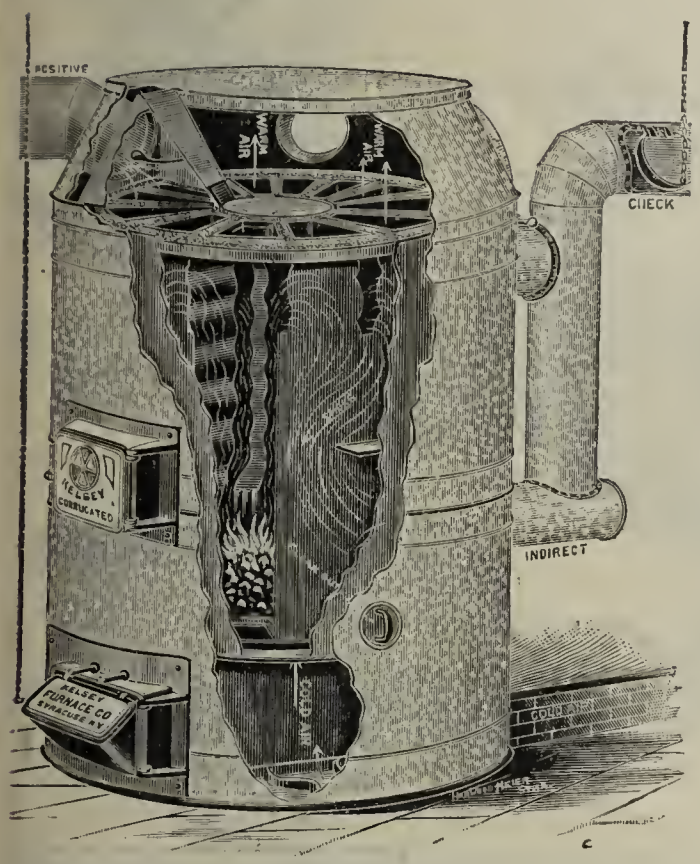
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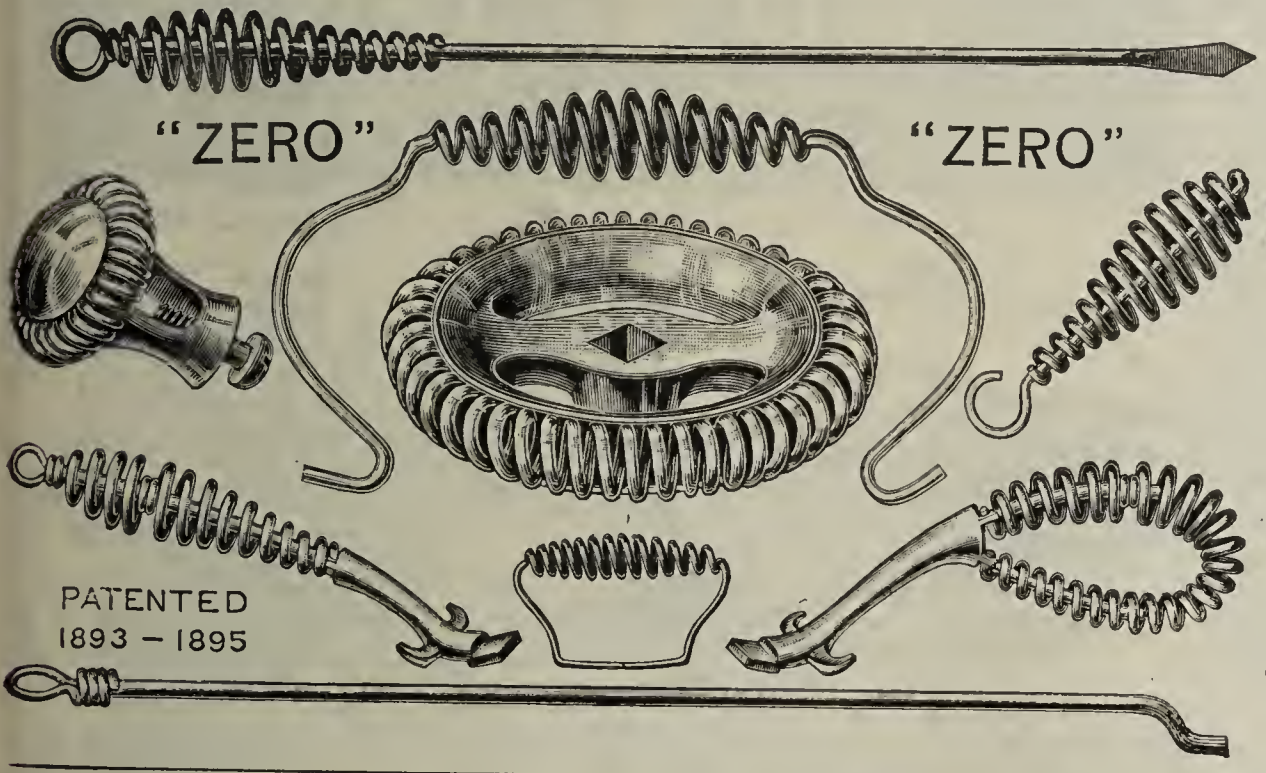
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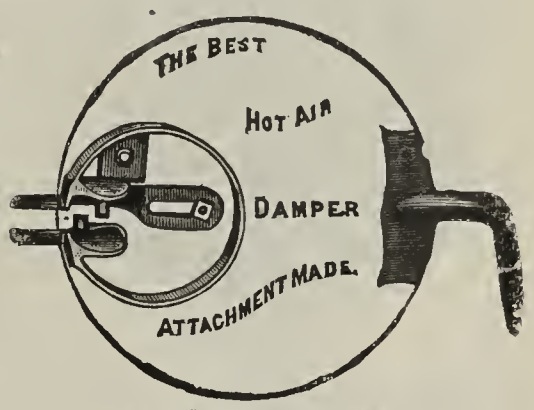
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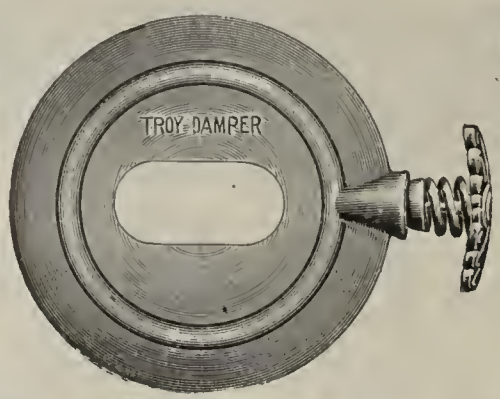
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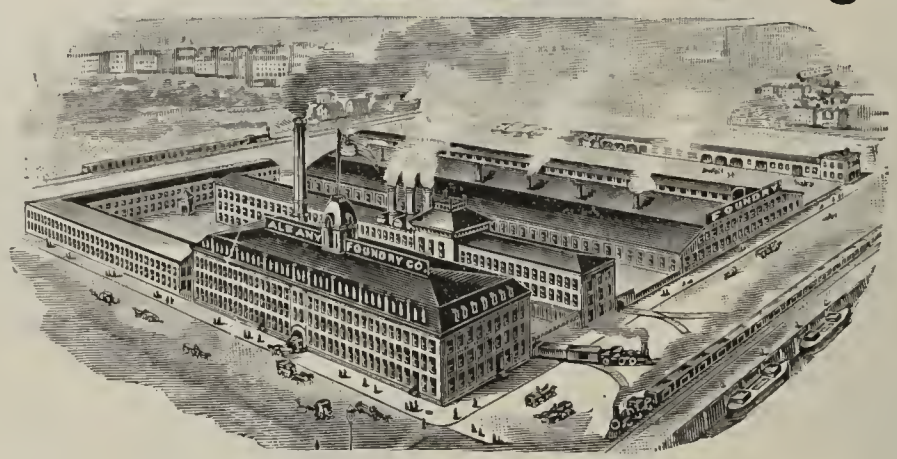
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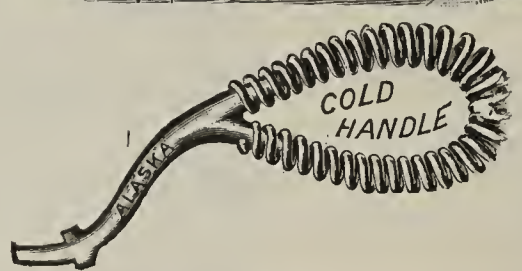


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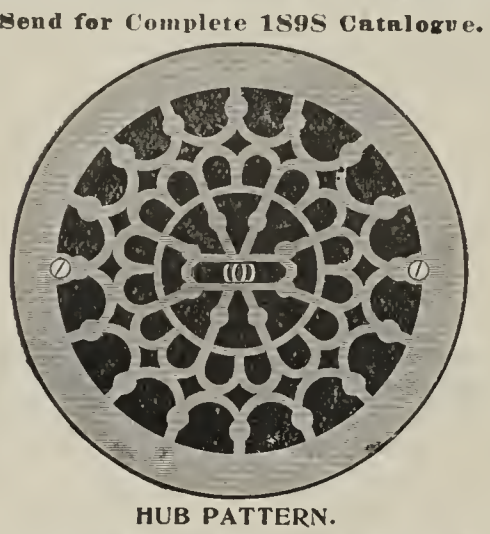
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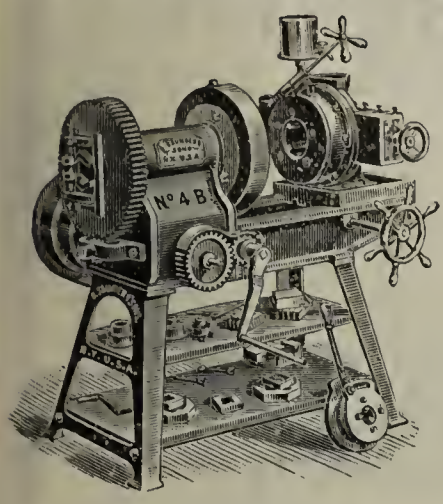


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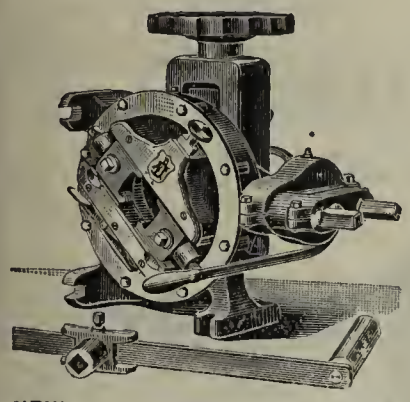
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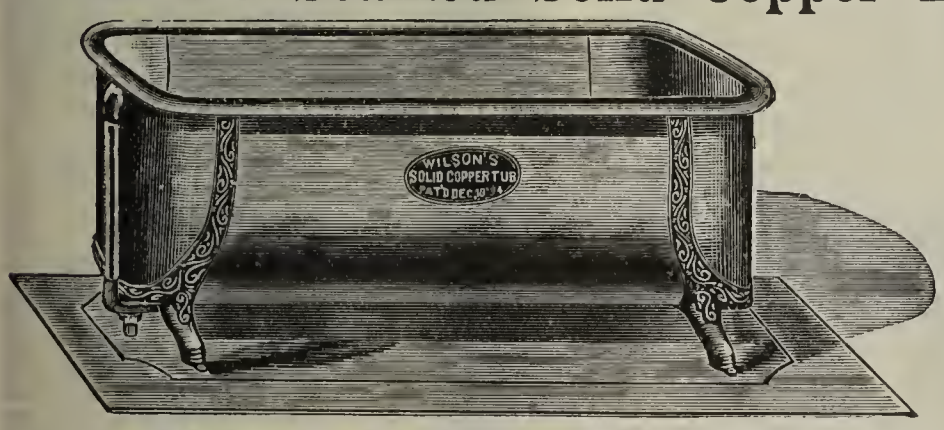
NEW No. 0 THREADING MACHINE

139 Centre St., New York. BRIDGEPORT, CONN.

TIME IS MONEY!

Therefore waste no more time in looking further when we have just what you want,

A Double Seamed Solid Copper Bath Tub,



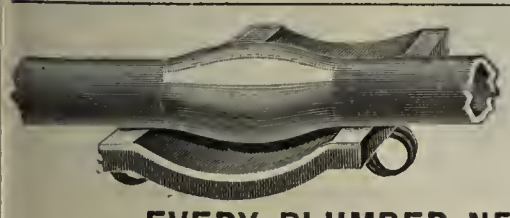
THE MOST SANITARY TUB IN EXISTENCE.

The only one upon the market.

Send for illustrated Catalog of Bath Tubs, Tanks, Seats, Copper Range Boilers and Plumbers' Brass Work. Manufactured by

R. M. WILSON,

Rome, N. Y



Porsch's Moulded Wiping Cloth.

PATENT APPLIED FOR.

EVERY PLUMBER NEEDS THEM IN HIS BUSINESS.

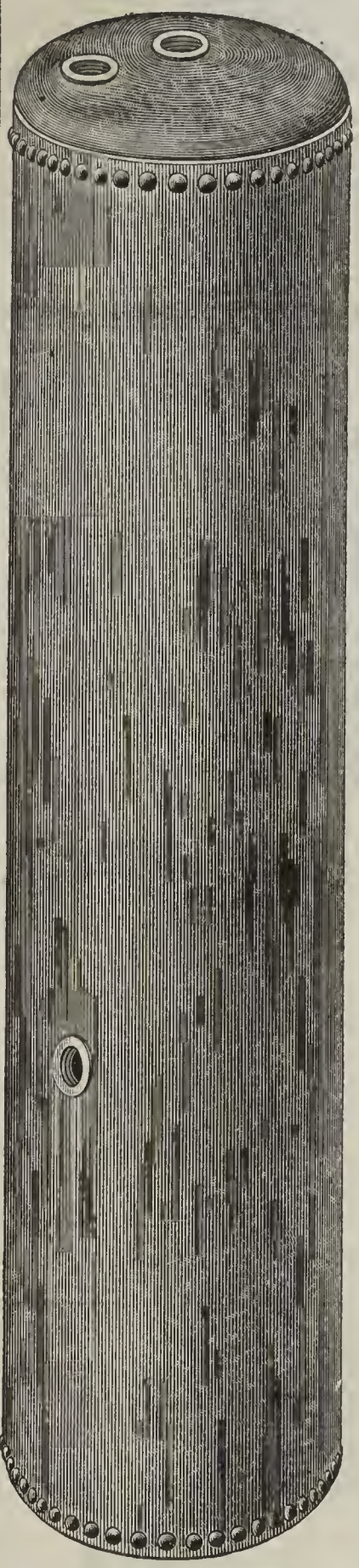
It makes a smooth, uniform joint. Any man familiar with the nature of the metal can make a first-class joint. *PRICE $1.00, C. O. D.* Delivered free when cash accompanies order.

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GENERAL OFFICES:
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BRANCHES: DENVER, MINNEAPOLIS.



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PLUMBING GOODS.

When Buying Boilers, ask for the "WOLFF" Boiler.

GALVANIZED RANGE BOILERS.

We operate a complete and extensive plant for the manufacture of Range Boilers, Expansion Tanks, etc. We do our own *Galvanizing*, make our own *Rivets*, and do the drawing-up work of the heads; our customers can therefore rely upon getting a first-class high grade Boiler. It is the best made. We make these Boilers in all sizes, from 18 to 192 gallons capacity; also Boilers with Galvanized Iron Steam Coils inside (horizontal and vertical), Boiler Hangers, Stands and Brackets.

Write for Illustrated Circular.

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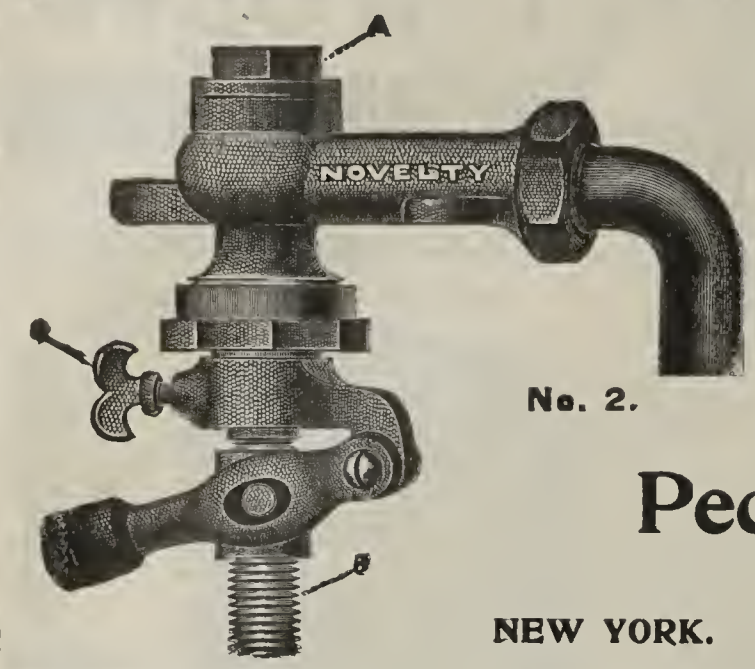
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Manufacturers of

LEAD PIPE, SHEET LEAD, SHOT,

And Sellers of

Everything You Want for Plumbing.



No. 2.

The Novelty Ball Cock

(PATENTED).

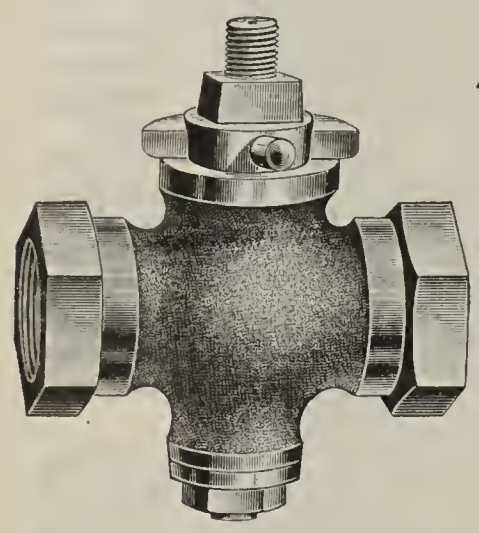
Top Supply. Made also for Bottom Supply. Noiseless. For High or Low Pressure. Easily Repaired. Write for Prices.

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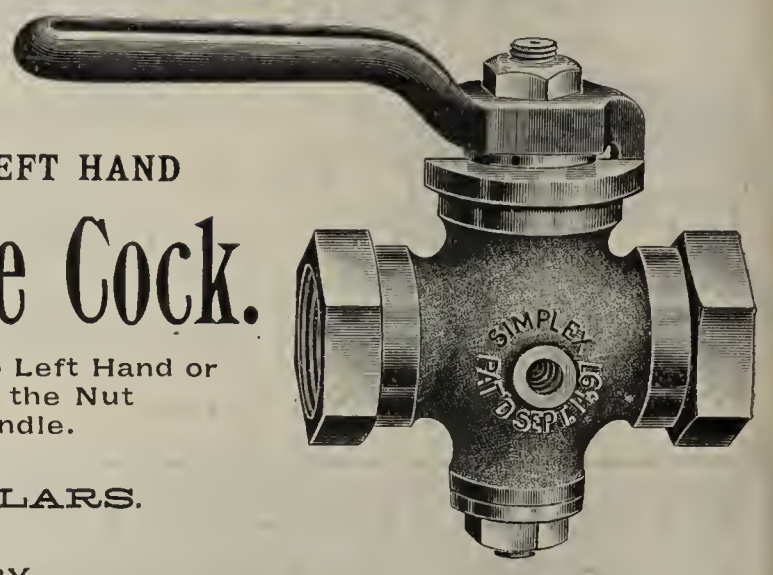
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SIMPLEX



REVERSIBLE RIGHT OR LEFT HAND

Stop and Waste Cock.

Instantly Changed from Right to Left Hand or vice versa, by Unscrewing the Nut and Reversing the Handle.

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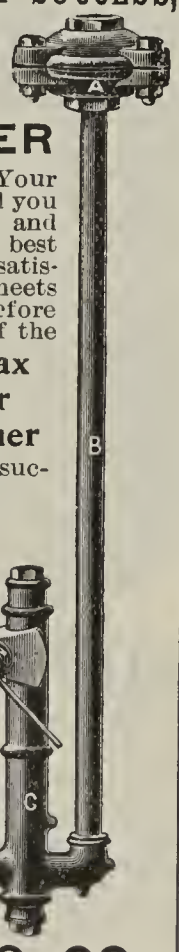
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hence the unqualified success others have experienced with the

CLIMAX CELLAR DRAINER



should induce you to use it also. Your customers need This Drainer, and you should write to-day for circular and prices, because it is the Plumber best qualified to do intelligently and satisfactorily all classes of work who meets with the greatest success and therefore the success of the

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Years of effort have enabled us to produce a Drainer of marvelous perfection, entirely free from stuffing boxes, springs, packings and washers; a result not accomplished by any other manufacturer.

The simplicity, reliability and superiority of the **Climax Cellar Drainer** are proverbial.

Sold by all Jobbers.

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Leather and Rubber WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

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Self-Acting Frost-Proof, After-Flush Closet.

For Extreme Cold Places and Out of Door Work.



When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

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201 Madison St, Chicago,

Manufacturers of Permanent Plumbing Goods



New Style.

OUR PATENTED IMPROVED

Broughton Self-Closing Basin Cock.

No exposed working parts.

Every intelligent plumber will appreciate this.

The Broughton work has been in use many years.

Unsurpassed for strength and durability.

Every one warranted.

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E. STEBBINS MFG. CO.,

Factory at Brightwood, SPRINGFIELD, MASS.

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SHEET METAL SPECIALTIES,

STAMPING AND PRESS WORK IN EVERY VARIETY.

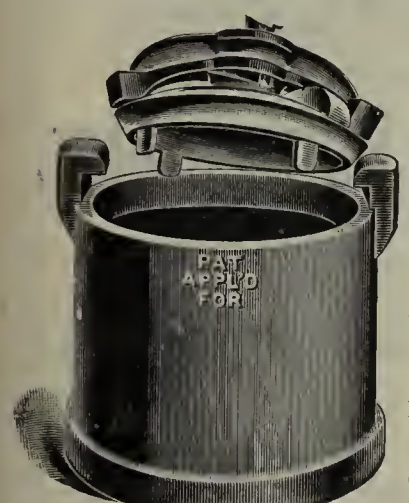
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ROUND and SQUARE CANS for PAINTS, OILS and VARNISHES.

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Boston Cleanout—Cover off.

The Proof is in the Using

That "THE BOSTON" is the CHEAPEST PRACTICAL Cleanout on the market.

ABSOLUTELY WATER TIGHT

As it is made with Ground Joint, requiring no screws or washers.

READILY ADJUSTED.

Made with Heavy Iron Body, neatly Japanned, and Brass Cover. A Durable and Perfect Casting.

CRAWFORD & YOUNG, Manufacturers,

224 Franklin St., Boston.

VANDERMAN'S 1897 Specialties.

Send us your address, and in return we will send you a catalogue of the best line of specialties in the United States,



Consisting of

Steel tool chests, steel frame portable work bench, pipe bending form, leak stopper, cast iron pipe cutter, lead pipe cutter, asbestos joint runner, combination vise for holding brass and nickel plated pipe, combination portable shower bath, bath tub seat without metal parts combination bench and pipe vise, malleable iron hinged vise with bending forms, lead pipe bender, plumbers' pocket estimate book and other specialties.

Manufactured and for sale by

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WILLIMANTIC, CONN.

"H. & W." ALUMINUM TEA KETTLE.

Cast in one piece of special hard aluminum.



TALKING POINTS:

No Seams, Knobs, Rivets or Solder.
Shines like Silver.
Won't Chip, Crack or Break.
Cover opened and closed by the bail.

Send for a Sample or a Circular.

ORDERS FOR ALUMINUM CASTINGS Solicited.

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ACID SWABS. Send two 2c. stamps for sample. You can help me to make a living. I can save you money. Ask your jobber for them.

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"L. & G."

Improved Milk Cans

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Milk Can Stock.

Made New York, Philadelphia, St. Louis, Elgin and other heavy patterns. Also Cheese-factory Can Stock.



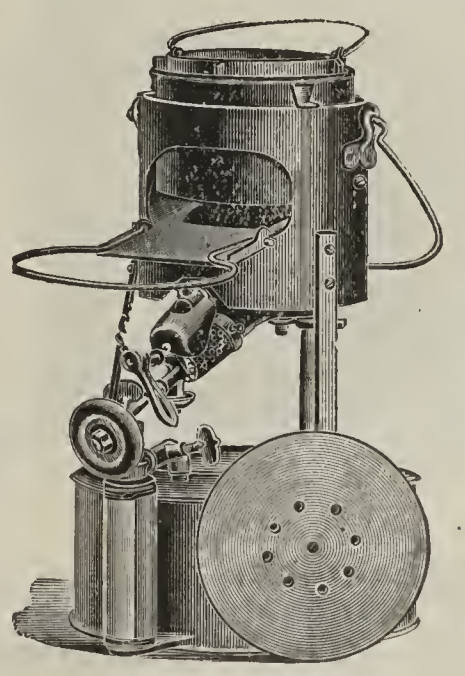
The "L. & G." is the best and strongest Milk Can in the market.

It has the Patent Breast, Neck and Bowl, made of one piece of tough Steel.

Price-list mailed on application.

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No. 2 BONANZA Combination Furnace



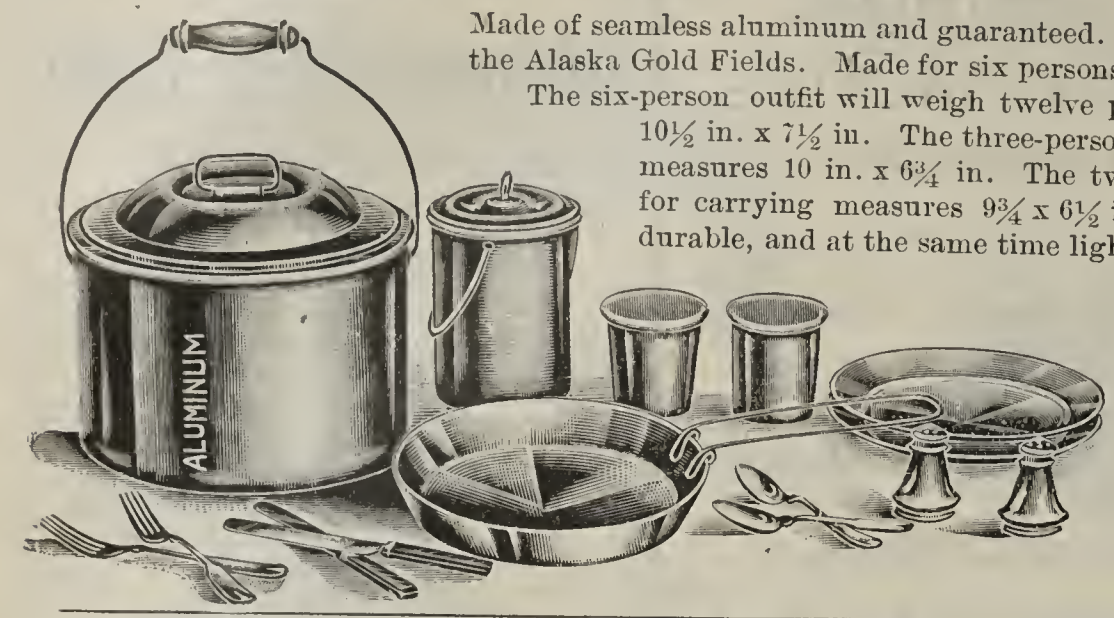
For Plumbers and Tinners.

Price $6.50 combination, including Lead Pot and casting. Price $6.00 for Plumbers alone. Galvanized iron tank with brass top; my patented rubber pump handle; a double burner, burns inward from both sides; hottest fire ever produced from gasoline; melts 10 pounds of lead in five minutes; heats 5-pound coppers in three minutes; cannot blow out. One dollar off cash with the order. Look out for "ad." of Bonanza No. 1 and No. 3. Write for catalogue.

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—THE following curious announcement was recently made in a suburban church: "This evening the Rev. Mr. Smith will preach his farewell sermon, and the choir will render a thanksgiving specially composed for the occasion." —*N. Y. Tribune.*

ALUMINUM CAMP OUTFITS FOR KLONDIKE.



Made of seamless aluminum and guaranteed. Proven to be the only successful camp outfit for the Alaska Gold Fields. Made for six persons, three persons or two persons.

The six-person outfit will weigh twelve pounds and when packed for carrying measures 10½ in. x 7½ in. The three-person weighs 6½ pounds, when packed for carrying measures 10 in. x 6¾ in. The two-person weighs four pounds and when packed for carrying measures 9¾ x 6½ in. No solder used, nothing to rust, strong and durable, and at the same time light and convenient to carry.

Special prices quoted to dealers. Write at once. Made by

THE ILLINOIS PURE ALUMINUM COMPANY,

LEMONT, ILL.

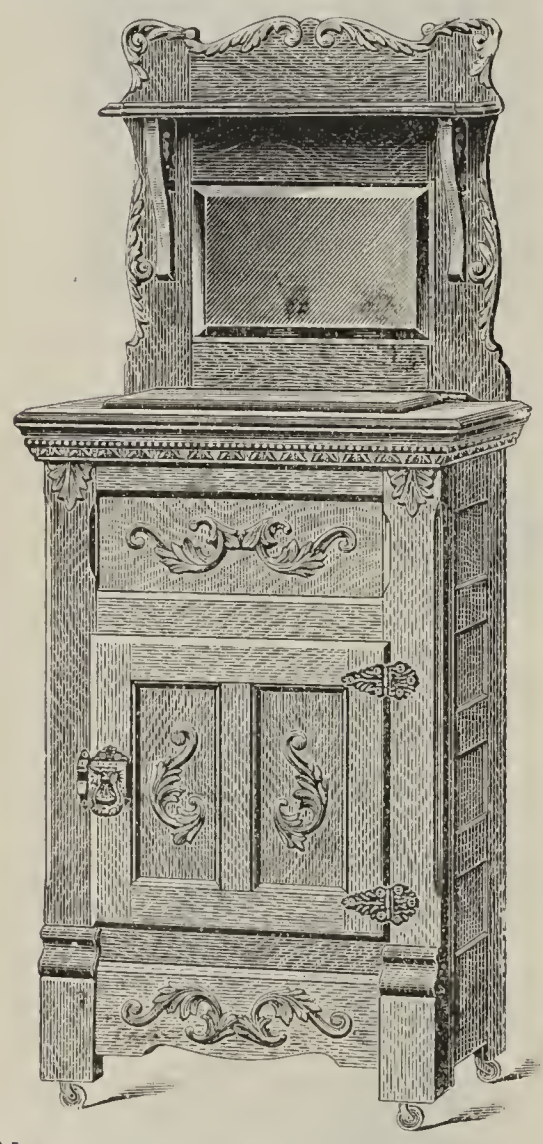
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Up-to-Date

IN ALL IMPROVEMENTS.

Hard and Soft Woods . . . .

Some Exclusive Points of Excellence.



New Columbias,
Champions,
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New Domestics.

Patented Removable, Cleanable, Ice Chamber. New Patent Automatic Siphon. New and Rich Carvings. Oxidized Trimmings, Perfect Wood Felt and Charcoal Sheathing Insulation. Fine Finish.

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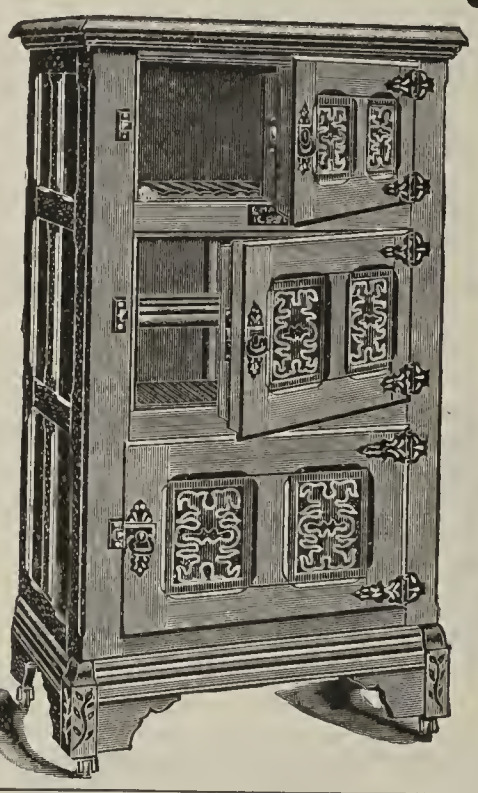
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Office 119 Gwinnett Street,
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"Buy the Best."

The Challenge Iceberg Refrigerator.



Large dealers in first-class refrigerators will do well to ask for our 1898 catalogue and discounts.

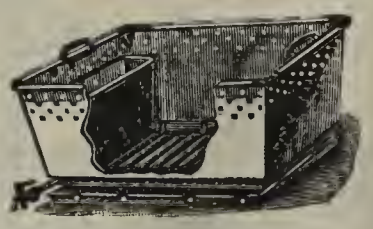
WRITE TO THE

Challenge Corn Planter Co.,

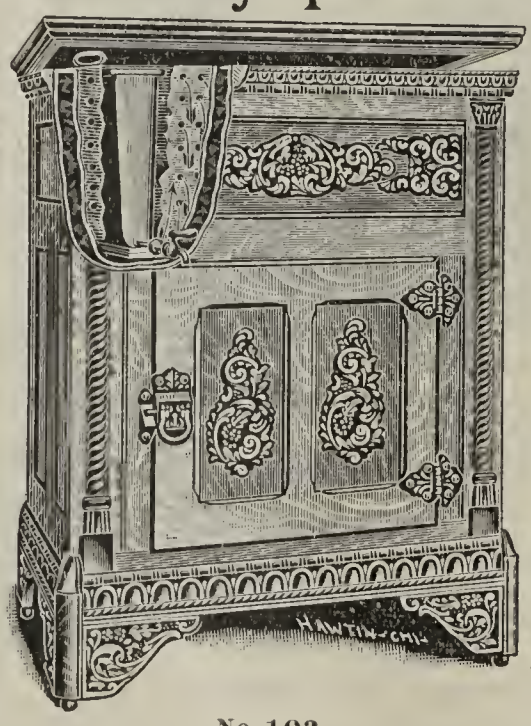
GRAND HAVEN, MICH., U. S. A.

The Gurney can be kept absolutely pure and clean

By the use of the



Removable Galvanized Ice Compartment



No. 103

THE GURNEY LEADS, OTHERS FOLLOW.

All users testify to the GURNEY'S many points of superiority.

The trade look to the GURNEY as criterion for style and finish.

Manufacturers testify to the GURNEY'S right of leadership by imitating the GURNEY style of construction.

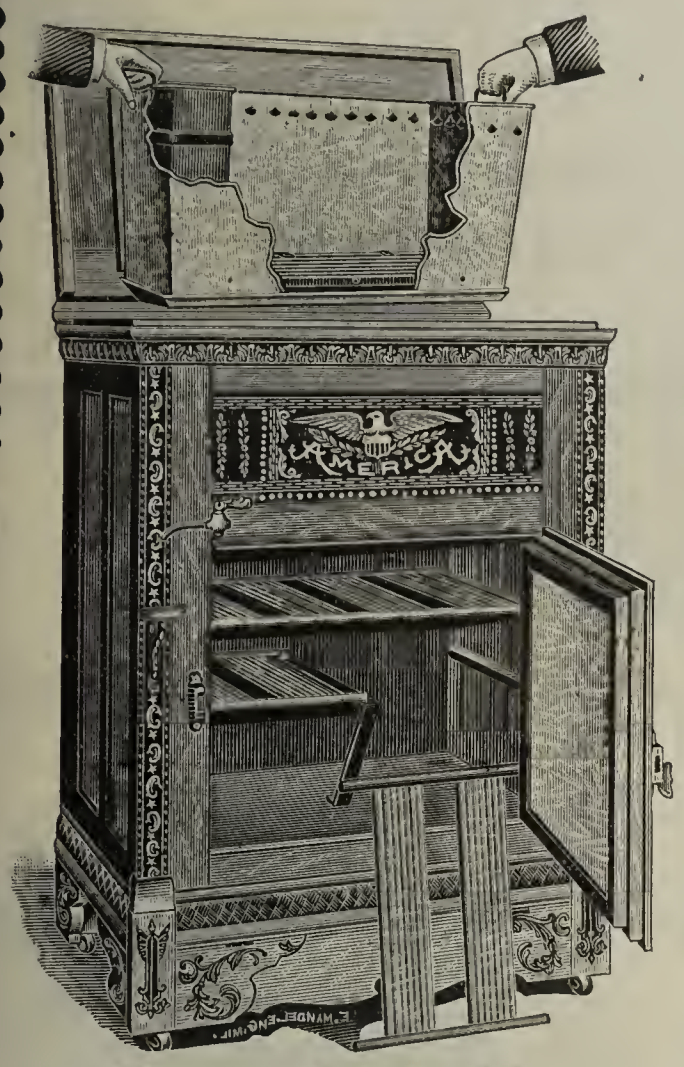
Buy the Gurney Patent Refrigerator. It costs no more than imitations claimed to be "*made like the Gurney.*"

GURNEY REFRIGERATOR CO., FOND DU LAC, WIS., U. S. A.

Also Mfrs. of La Belle and Imperial Refrigerators Capacity 150 Refrigerators per day.

BOWEN'S AMERICA REFRIGERATORS.

IN NEW DESIGN FOR 1898.



Has Patented Removable Galvanized Ice Compartment, is the Neatest, Strongest, Best and Only Perfect and Practical Ice Compartment Made.

It also has a Separable, Removable Porcelain-Lined Water Cooler, found in no other.

All parts are accessible for cleaning with the least trouble.

No weak attached bottoms to become bent and out of order, as is the case in similar old style devices.

By our superior construction the lowest temperature, quickest drainage, driest air and best circulation, with the least consumption of ice, is obtained in the shortest possible time.

These claims are not mere assertions but are based upon actual tests.

Our new exterior designs for excellence in finish and workmanship are acknowledged by all who have seen them as being the leaders and without a rival.

Our trimmings are of the latest designs and manufactured especially for our use.

The walls are lined with charcoal sheathing, and filled, including bottoms, with mineral wool, the best non-conductor known to science.

Also fitted with center removable shelf rest to accommodate parted shelves for convenience in storing jars, etc.

No old style goods carried over, all new and quick sellers.

Dealers can make no mistake in the purchase of these refrigerators. Send for sample and investigate our claims.

OVER 60,000 NOW IN USE.

Write for Illustrated Catalogue and Price-List of the Best Refrigerator Made.

THE BOWEN MFG. CO., Fond du Lac, Wis.

BALDWIN

New, * Neat, * Natty.

WE MAKE 125 VARIETIES OF HANDSOME REFRIGERATORS. EVERY ONE STRICTLY HIGH GRADE.

BALDWIN REFRIGERATOR CO.,

BURLINGTON, VERMONT.

Send for our Catalogue of

Kitchen Specialties.

They sell at sight.

GENUINE DOVER EGG BEATERS.

The Ideal Tea Strainer.

Neatest, Simplest and Cheapest.

Holds the Drip. Saves the cloth. Fits any spout. As good for coffee as tea



Strong, Durable and Ornamental. Send for price.

Safety Match Safe.

Combining a safe for matches and a large receptacle for burnt ones, making a *Real Safety Match Box.*

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GALVANIZED IRON GOODS.

DOVER STAMPING CO., Boston, Mass.



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—MANUFACTURERS—

Granite Ironware AND Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: ***NEW YORK.*** ***CHICAGO.*** ***BOSTON.***

THE HIT OF THE SEASON.

Utility Steel Baskets

Sizes, 1 and 1½ Bush.

Japanned and Galvanized.

Made from Refined Smooth Steel.





STRONG, WATER-TIGHT, EVERLASTING.

Suitable for Measuring and Handling

Grain, Vegetables, Coal, etc.,
Feeding Stock,
Carrying Water, etc.

Handle Patented August 4th, 1896.

Be sure to order at once.

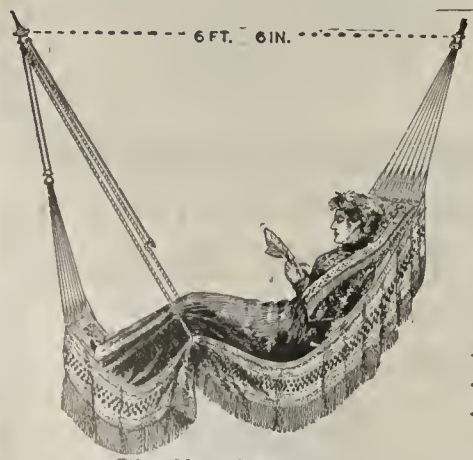
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KIECKHEFER BROS. COMPANY, Milwaukee, Wis.

PALMER'S HAMMOCKS STILL LEAD.

Again ahead of the world in variety of colors, styles and sizes, in our elegant lines of *Perfection and Arawana Hammocks.*

INFRINGERS ARE BEING PROSECUTED.



The New Hammock.

PALMER'S UTOPIA.

Position easily varied, ranging from sitting to sleeping.

See our catalogue for special assortment of bales for small buyers.

THE LATEST LEADER.

PALMER'S NEW UTOPIA HAMMOCK.

Superior to all others.

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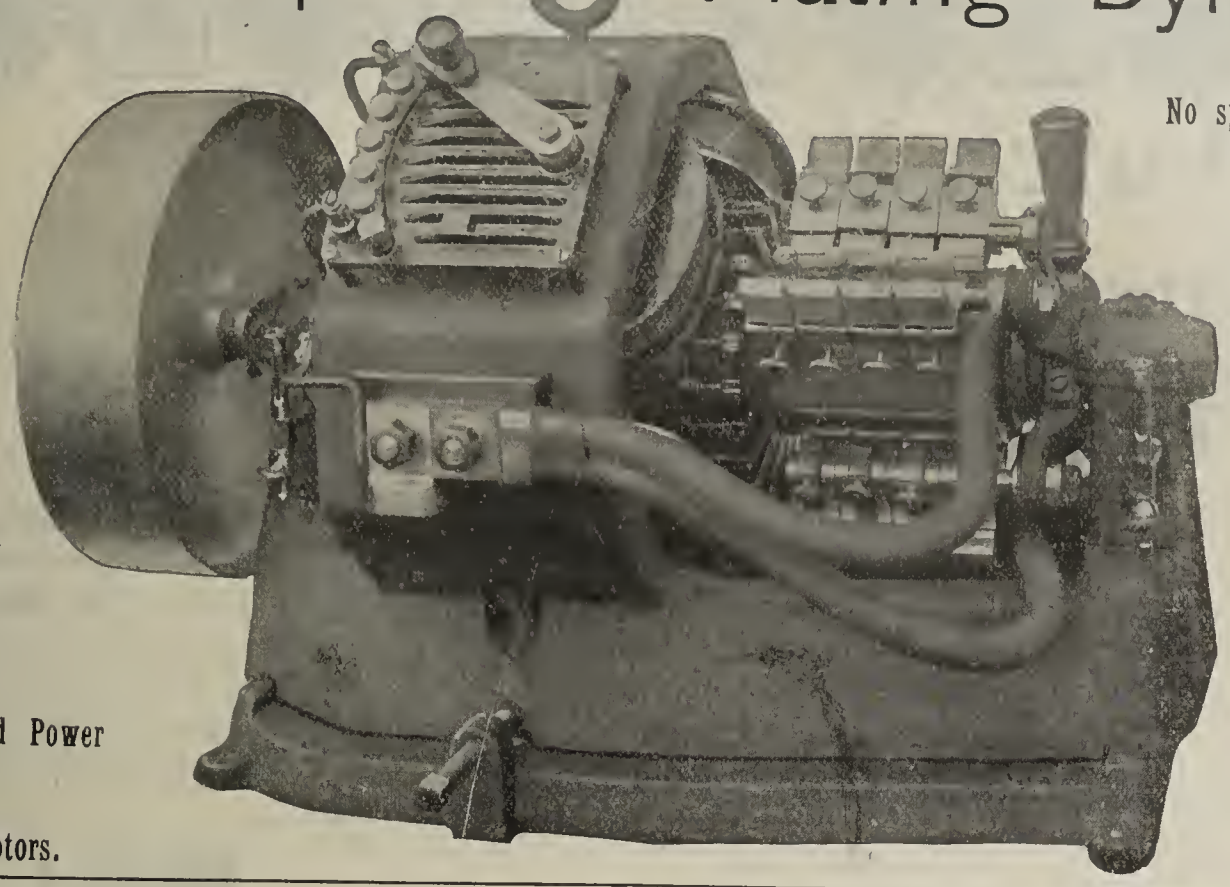
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New York Office, 62 White St.

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Eddy Low Speed Plating Dynamos.



HIGH GRADE both Mechanically and Electrically. Wear of Commutator and Brushes reduced to a minimum. Requires practically no attention.

Also Electric Lighting and Power Apparatus and Electric Motors.

No sparking with variable loads.

Runs cool at rated capacity.

Correspondence Solicited.

Circulars on Application.

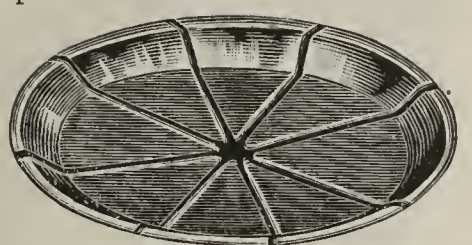
THE EDDY ELECTRIC MANUFG. CO.,
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"PRINCESS" CHILD'S TRAY.



Japanned.

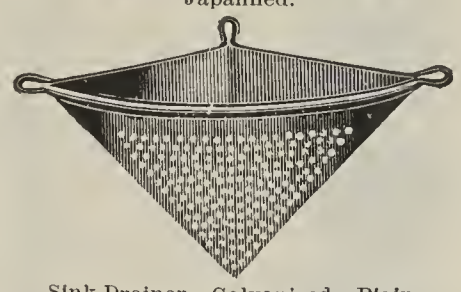
The only Child's Tray that fully protects. Fitted closely around body of child with high projection in front. It gives perfect protection to the child and prevents soiling of table cloth or carpet.



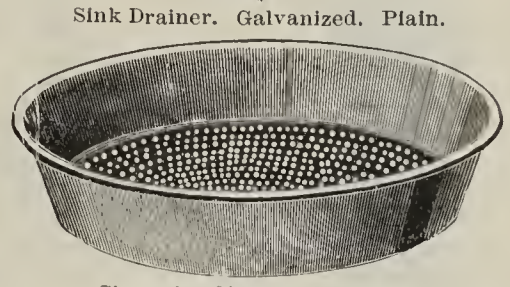
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Japanned.



Sink Drainer. Galvanized. Plain.



Champion Sieves. Two Sizes.

Here are just a few specimens of our full line of Pieced, Heavy Polished Stamped and Japanned Tinwares, Galvanized Ware, etc. Write us for catalogue and prices.

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BALTIMORE, MD.

Office and Salesroom, 16 W. BALTIMORE STREET.

SPERRY'S CALDRONS....



Full measure, guaranteed perfect, original patterns, with metal distributed where it is needed. Many Caldrons are made from our castings as patterns. They are inferior to original, as they have light bottoms and heavy sides and hold less.

TWELVE SIZES ALWAYS IN STOCK.

D. R. SPERRY & CO.,
HOLLOW-WARE FOUNDERS,
BATAVIA, ILL.



THE WILLIAMS PRINTING CO.,

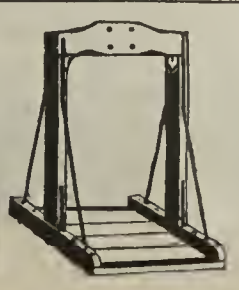
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ESTIMATES FURNISHED FOR ALL CLASSES OF WORK.

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The only SPRAY PUMP that Dealers can handle successfully. Sprays from bucket or barrel 50 feet. New scientific and mechanical principle. Special low rates to dealers. Catalogue free. H. B. RUSLER, Johnstown, O.



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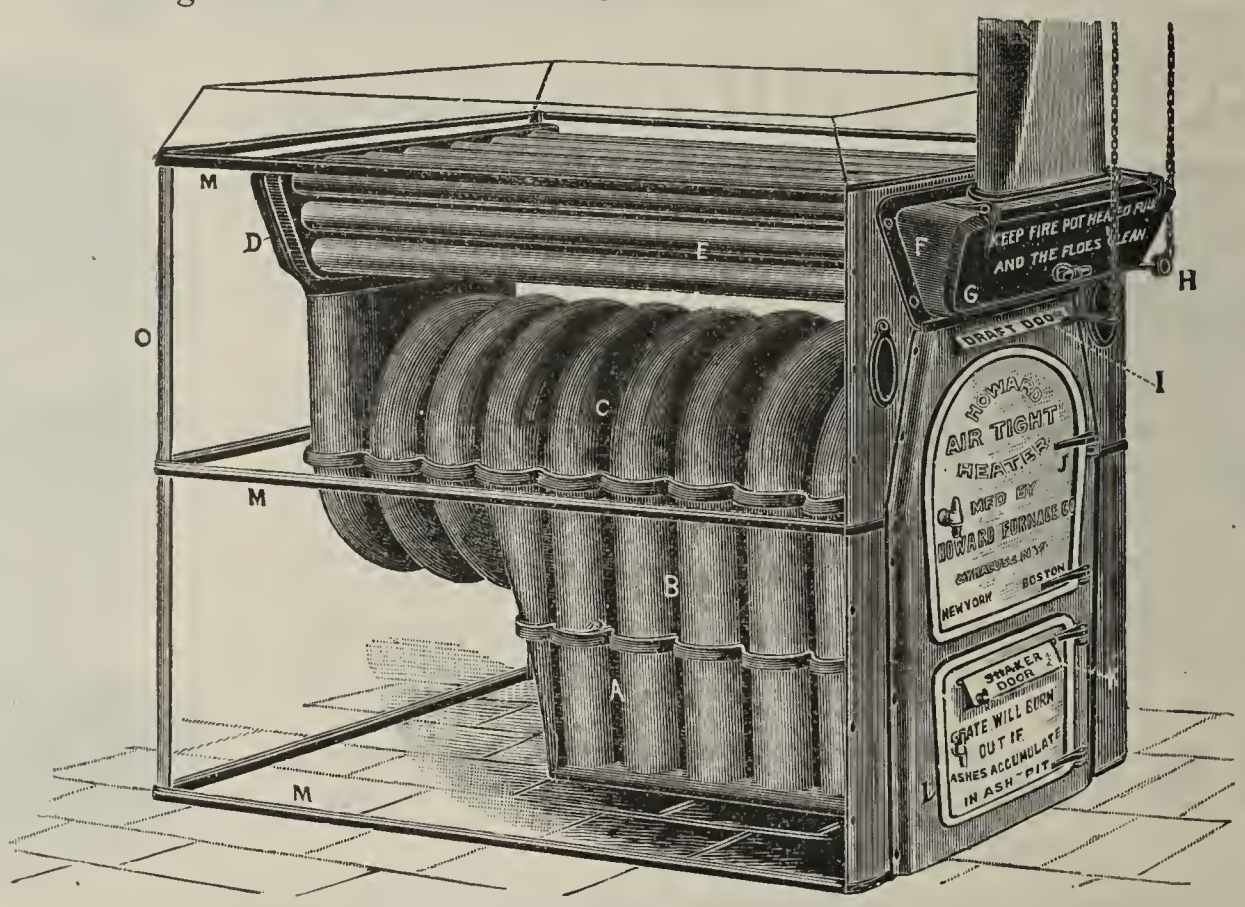
made to be sold by the Hardware trade. Can be placed in position by any carpenter. Catalogue free.

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Watch Your Cues and Figures

The fellow who wants to do business must stir up his customers with a furnace that's built differently from the ones the other fellows sell He wants a furnace that will stand investigation like ***this*** one, so he can worry his competitors with good working points. There is oftentimes too much similarity with furnaces to make a choice any object except the price. If a dealer makes money in the furnace business he wants goods that look well, which sell easily, and give good satisfaction when used.



PATENTED JULY 13th, 1897.

Start the New Year

with our line of tubular construction. It will bring you business away from the best of them. Try it. A letter of enquiry is solicited. Already the reports come to us, telling how well these furnaces act. If you want letters of commendation, we can furnish them by the score. We believe we can satisfy anybody as to their worth. Why not you?

THE MAKERS,

Howard Furnace Co.,

Syracuse, N. Y.

NEW YORK OFFICE,
231 Water St.

BOSTON OFFICE,
198 Spruce St., Sta. H (Chelsea).

THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, February 5, 1898.

DAVID WILLIAMS COMPANY, - - PUBLISHERS.

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CLEVELAND.....312 The Cuyahoga.

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The Business Situation.

The belated wintry weather which arrived last week and spread its frigid touch over a large section of the country, as if to make up for past deficiencies, has made its presence felt in storms of unusual severity, impeding communications and crippling transportation to a considerable extent during the past week. The volume of general trade has suffered thereby, not in the West only, but also in the Middle and Eastern States, where heavy snows have temporarily interfered with the distribution of merchandise. At the same time the sale of winter goods, which had been unusually slack during the mild weather which prevailed earlier in the season, has received a fresh stimulus. As a whole, the volume of current business continues excellent. Judging by the trade reports, the month of January was the most active in point of general trade of any corresponding period in the commercial history of the country. With the exception of December, 1892, it furnished the largest total of bank clearings for any one month on record, aggregating close to six billion dollars, a gain of no less than 33 per cent. over January, 1897, and of 30 per cent. over January, 1896. Moreover, the gains were distributed over the entire country, only the cotton manufacturing centers of New England, where strikes have closed many of the mills, making an unfavorable showing. The manufacturing industries generally display marked activity. Most of the mills and factories are running full, and many overtime, to keep up with business in hand or in prospect. Merchants report a better feeling among retailers and consumers. Orders now coming in are reported to be on a more liberal scale, and there is a more distinct tendency toward buying for stock than has been in evidence for a long time. Prices, while showing no noteworthy changes, are in general steady, with an upward tendency in some quarters. The price of cereals has advanced sharply, wheat selling at the highest point in six years, and continued heavy exports of wheat and corn, despite the advance, show plainly the urgent call for breadstuffs abroad. The stock market shows pronounced strength, with heavy speculative and investment buying, on an advance in prices for the week averaging $1.37 per share in railways and 61 cents per share in "industrials." The tonic effect of the emphatic rejection by the House of the Teller resolution to pay interest on Government bonds in silver, and of the declaration in favor of the maintenance of the gold standard made by President McKinley at the banquet of the Manufacturers' Association, has done much to stimulate confidence in the minds of the business community here, while its favorable influence abroad is seen in the strength and activity of American securities in the European markets. The record of business failures last week showed the smallest total for five years. Railway earnings continue to improve radically and the gains reported cover practically all the roads, the increase for last month averaging about 15 per cent. over January, 1897.

Peace in the Western Coal Trade.

According to general opinion one of the most important industrial contests in the history of this country came to a peaceful conclusion in Chicago last week after a ten days' struggle. The bituminous coal operators and miners of Illinois, Indiana, Ohio and the Pittsburgh thin vein district of Western Pennsylvania, with a portion of West Virginia, met to agree upon a scale of wages for the year ending April 1, 1899, in order to avoid friction in this important industry. It is stated that no less than 200,000 miners are affected by the scale which was adopted. This is not only an enormous number of workmen, but dependent upon their labors is a much greater army employed in all sorts of occupations in the Central West which cannot be prosecuted without a regular supply of coal. The questions to be settled between the operators of the different sections and the coal miners were so complicated that from time to time the difficulties seemed insurmountable, and hope of harmony would almost be extinguished. But both sides were deeply anxious to have a fair settlement made and renewed efforts were put forth as old propositions were set aside, until finally common ground was struck amid mutual rejoicing. The leading features of the agreement are a uniform working day and a straight increase of 10 cents per ton in miners' wages. The uniform day is to consist of eight hours, with eight hours' pay, and for six days per week, with uniform wages for day labor in all districts.

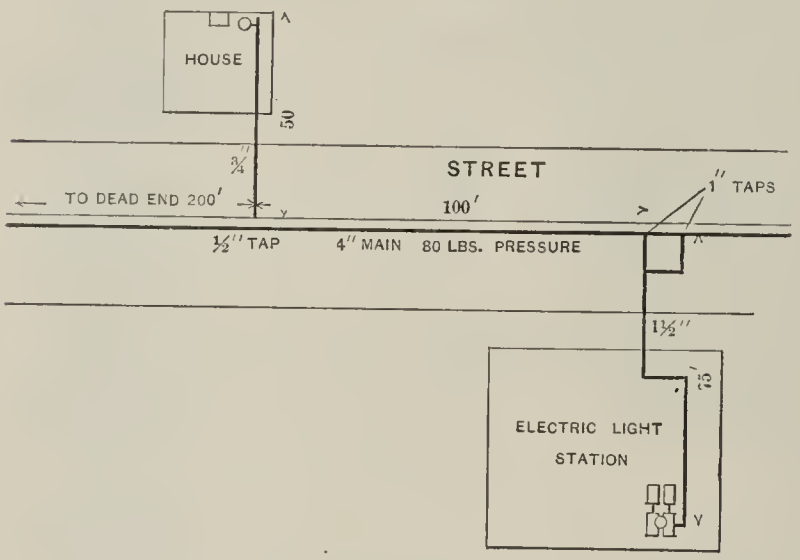
The New York Trade School Lectures.

The management of the New York Trade School has this year provided a series of entertainments for the pupils which should be beneficial as well as entertaining. The last lecture was by Paul Du Chaillu, the African explorer, and a large audience listened with great interest. The next lecture will be given on February 15 and will be by Cosmos Mindcliff, the well-known writer and explorer, who for years was connected with the United States Geological Survey Department. His ethnological researches in Arizona among the cliff dwellers will be the subject of his lecture, and it will be illustrated with numerous stereopticon views taken from photographs made by Mr. Mindcliff.

THE LETTER BOX.

Shock in Service Pipes from Pump.

From G. C., Dover, N. J.—As habit ofttimes becomes a custom, so appealing to the Letter Box becomes a necessity. The trouble in this case is with a double acting pump. In July last we put a plumbing system in a dwelling house situated on a corner, as will be seen in the sketch, and on the left you will notice an electric light plant. Things went smoothly until the middle of Novem ber when the electric light people turned the water on the pump from the street. Previous to this they had taken their water supply from the river nearby. But the pump did not draw sufficient water, as the sand had cut one of the cylinders, so the street pressure was needed to help it along. You will see that the electric light plant is on one side of the street and the house on the other quite a distance away. The end of the main is dead, as is shown on the diagram. The pressure is 80 pounds per square inch. The first thing noticed at the house was the action



Shock in Service Pipes from Pump

of the pump. The stroke could be heard nearly as plain as in the station, and in a few days the bottom of the boiler, although concave in shape, vibrated up and down like the throat of a greenback bull frog on the bank of a mill pond on a hot summer day, and in less than two weeks the writer had to replace the boiler with a new one, as the bottom cracked from the strain. What seems strange about the circumstance was that the boiler was stamped "Tested 150 pounds per square inch." Now should the action of the pump strain the boiler in that way? The writer placed a water gauge at the bib on the sink on the same floor, and had the pump in question started. The pressure was irregular, varying from 74 to 80 pounds. The lavatory is connected with ½ inch 2 A A lead pipe to the basin cock, according to the table given for working pressure of pipes, that weight being 60 pounds. Now how is it that the bottom went out of a new boiler? There are a great many theories that will not stand in practice, and I think this is a case in point, unless the boiler bottom was defective. As far as outside inspection showed, however, it was all right. To remedy this trouble I placed a 3 inch pipe 2 feet long on the ¾ main in the cellar for a cushion, and that muffled the sound so it could not be heard unless you placed your ear close to the air chamber. I don't think placing an air chamber in the suction of the pump would properly confine the shock so as not to make the boiler "dance" as they expressed it. But to overcome the trouble entirely I suggested connecting the dead end of main with the 6-inch main a block away. That would let the momentum equalize itself and pass off without any trouble. There are some people who differ in opinion from me, and I submit this to your judgment and await your decision.

Answer.—The water in a pipe system is non-elastic to a high degree, almost equally with the iron pipes of a water supply plant, and sounds and the harsher vibrations of a pump are sometimes carried through a whole water distributing system. The breaking of the head of the kitchen boiler was due to the constant vibration of the water and its pressure acting upon the weak part of the head, causing it to vibrate in unison with the strokes of the pump

There is the strongest probability, as indicated by the vibration of the water, that the pump has no air chamber on the suction side, or if it has one, that it has lost its air and the pump is moving a long column of water by jerks at every stroke. As the water is not elastic, the long column of water throughout the neighborhood cannot keep pace with the pump and stop and start with every stroke. The consequence is that a vacuum is formed in the pipe near the pump at every pull of the piston, which separates the water, and at the end of the stroke the water at the point of vacuum rushes together with a shock like a hammer striking the pipe. The impact is transmitted to great distances, and when it meets a yielding substance, like the head of the boiler in question, will in a little time destroy the tenacity of the copper and make it give way. The remedy is to put a large suction air chamber on the suction pipe near the pump with appliances to keep it nearly full of air, for water under pressure, as in this case, soon absorbs the air in the chamber and it becomes solid water when the old trouble will repeat itself. Another remedy is to draw the water into a tank with a regulating ball cock and pump from the tank. The 3-inch pipe that you placed in cellar will act as an air cushion, if arranged for that purpose. The connection of the dead end of the street main to the next main is very desirable to prevent stagnation of the water beyond the last tap, but it will not stop the hammer of the water.

Laying Copper Valleys.

From C., Mansfield, Ohio.—Will some reader of *The Metal Worker* kindly inform me through the columns of *The Metal Worker* what is the best way to put in new copper valleys on a slate roof, having two-thirds pitch? Shall I take off the slate on each side of the valley or cut the copper in pieces 10 x 14 and slide each piece up under the slate? There will be 16 valleys to be renewed, each about 16 feet long, and I would like to hear from some one who has done work of this kind before what the best and safest way is to do it.

Price for Connecting Service Pipes.

From T. R. W., Port Gibson, Miss.—I am doing business in this town, which has about 3000 inhabitants, and where a system of water works is now being put in. I would like to obtain information through *The Metal Worker* as to what is considered a fair price for tapping the main and running the pipes to the curb line. Is it customary for the corporation to buy a tapping machine, as the corporation has been thinking of doing this? I should be glad to hear from the readers on this subject.

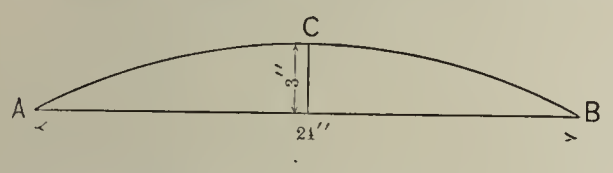
Note.—We trust that the inquiry of this correspondent will not be overlooked by our readers. In the meantime we would say that the custom in regard to tapping the water mains varies, but as a rule the corporation purchases its tapping machine and inserts the tap into the main. In some instances it also runs the pipe to the

curb line. Some of the manufacturing houses, in addition to making what are known as corporation taps, also sell goose necks for attaching to the taps to which several feet of lead pipe are connected by means of a wiped joint, leaving the plumber to connect his service pipe to the end of this lead pipe. If our correspondent will write to the water works commissions of some of the towns in his vicinity of about the same size as his own they will doubtless give him the figures which they pay for doing the work about which he inquires. In so small a town it is quite possible that the Water Works Board would be willing to purchase the tapping machine and arrange to have some competent plumber tap the main and make the connection.

Finding the Radius of a Circle from Chord and Rise.

From E. M. B., Celina, Ohio.—Be kind enough to publish in *The Metal Worker* a rule for setting a pair of compasses to draw a circle, when the length of the chord and the rise are given, as shown in the sketch sent herewith. The line A B is 24 inches long and the arc A B C rises 3 inches from the chord.

Answer.—A rule for this is somewhat complicated, but we think our correspondent will be able to follow it. The radius, which is the distance which the compasses would have to be set, is equal to one-half the distance A

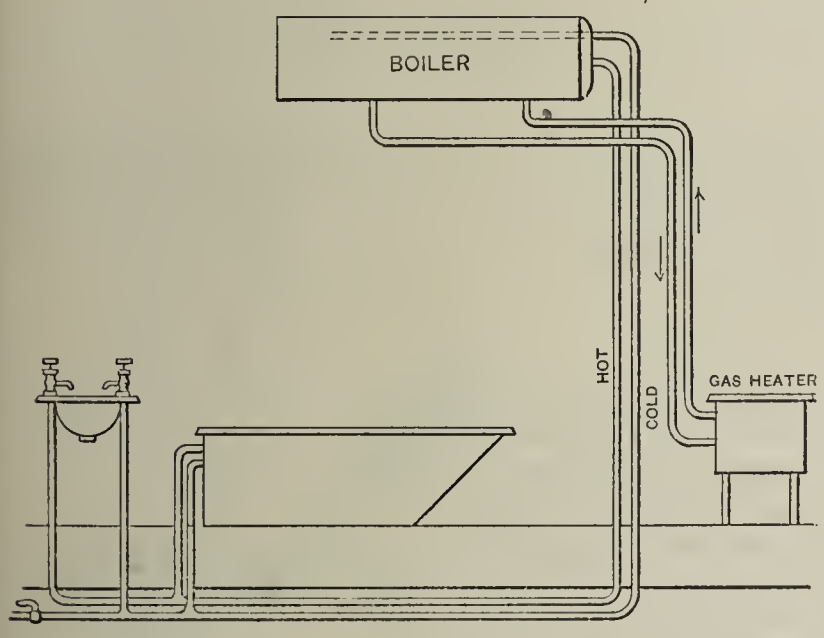


Finding the Radius of a Circle from Chord and Rise.

B, which is equal to 12 squared (or multiplied by itself), which equals 144, added to the hight 3 inches squared, which is 9, making 153 for the sum. This figure is divided by twice the rise or 6, giving for an answer 25½ inches, which is the radius of a circle that will pass through the points A, C and B.

Setting a Vertical Boiler Horizontally.

From H. J. D., Friendship, N. Y.—There is in use in this place a boiler suspended horizontally from the ceiling of a bathroom, which does not work satisfactorily. The



Setting a Vertical Boiler Horizontally.—Fig. 1.—The Piping System that is Unsatisfactory.

water in the boiler is heated by an instantaneous gas heater and connected as shown in Fig. 1. The people using the fixtures say that they draw hot water from the cold pipes and *vice versa*. Sometimes on opening the hot water faucet at the bathtub hot water only runs a short time, then it comes cold. I should be glad to have you give your opinion as to whether the connections are properly made, and if not how they should be made.

Answer.—In the book entitled "Kitchen Boiler Connections," which can be furnished by our book department, a chapter is devoted to this subject. The unsatisfactory service in the case presented is entirely due to improper piping connections. A vertical boiler is not intended to be used horizontally, but can be made to render efficient service if properly piped. One method is presented in Fig. 2, which allows sediment to be washed out of the boiler in case of accumulation. It is placed so

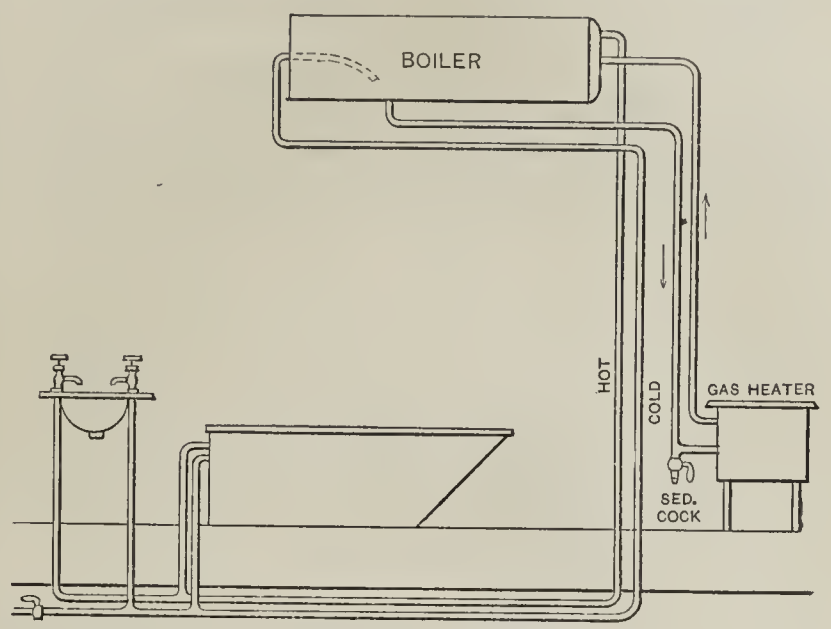


Fig. 2.—The Remedy Suggested.

that the hot water from the water heater enters the opening that is ordinarily used for the hot water service pipe at the top when the boiler is placed vertically. The cold water is brought to the water heater from what is ordinarily the side opening in the boiler. This affords opportunity for a free circulation and a storage of the hottest water at the top of the boiler. By placing a sediment cock as shown at the water heater the boiler and water heater can be drained. A pipe can be carried from this sediment cock and connected with the house drain or arranged to discharge over some fixture so as to make the flushing of the system a simple matter free from labor. The cold water delivery tube should be taken out of the boiler and the hot service pipe connected to it as shown. The cold water supply should be connected at what is usually the bottom opening in the boiler at the left end as shown. In order to prevent the inflow of cold water from mixing with the warmed water and chilling it, a curved delivery tube should be provided. The curved tube may be made of either sheet copper or seamless tubing, as the slight bend necessary can be easily made. If the hole to which the hot service pipe is connected is not near the outside of the boiler, or the top as placed, another curved tube should be used at that connection, the end of the tube turning upward so as to be near the top of the boiler where the hottest water is stored. If the system of piping is changed to conform with these suggestions, we think there will be none of the troubles now experienced. We shall be glad to have an account and sketches of any changes that may be made, and the success that attends them.

Gas Heated Smoothing Irons.

From K. S., Yonkers, N. Y.—Will *The Metal Worker* please inform me who manufactures pressing irons such as tailors use that are heated by gas?

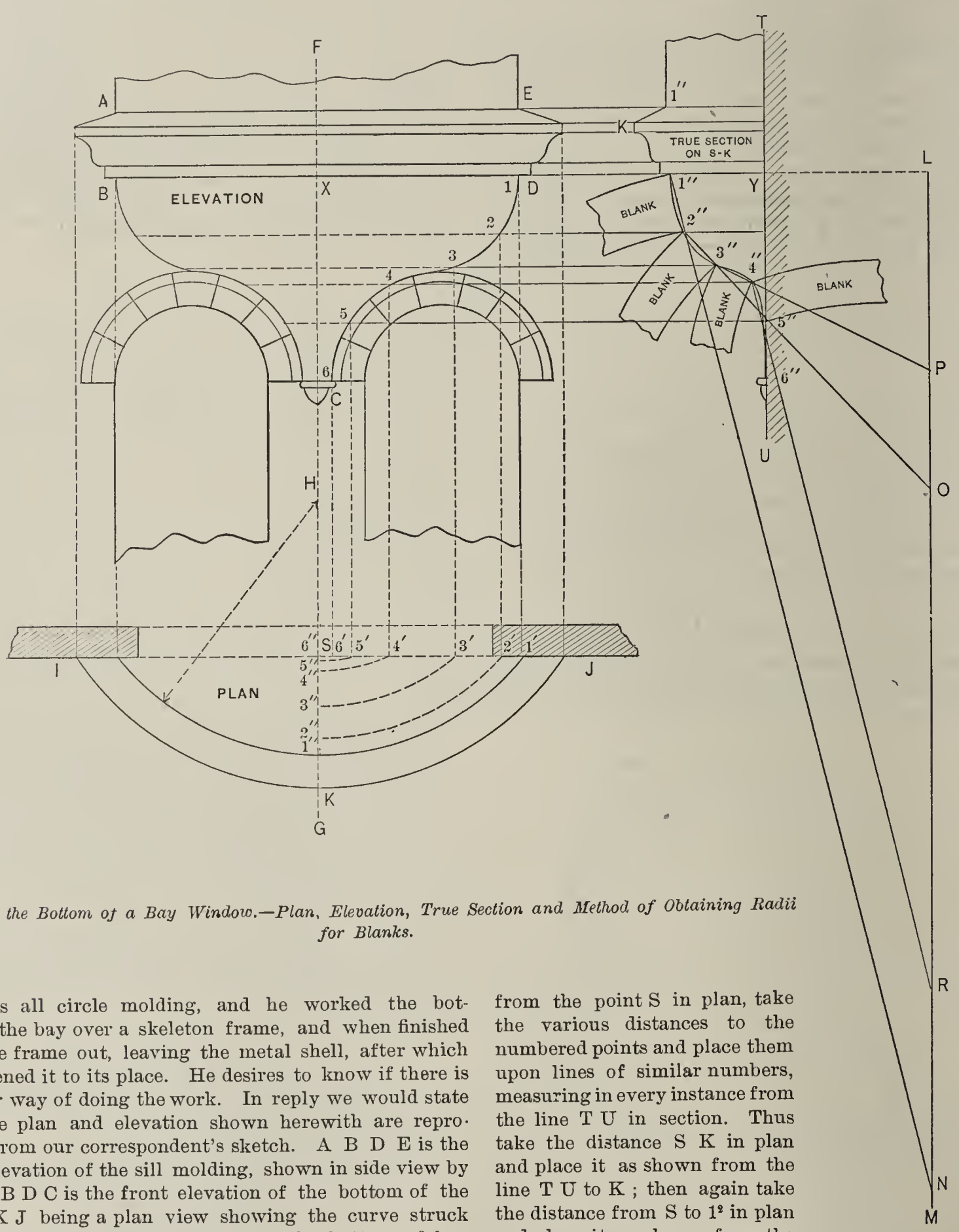
Answer.—Goods of this character are manufactured by the Chalfant Mfg. Company, Lancaster, Pa.

The De Witt Wire Cloth Company, New York, are now making wire cloth of aluminum for certain special purposes. On account of its lightness there seems to be a field for aluminum wire cloth in directions where that quality is especially desirable. Its immunity from rust is also a recommendation. It is considered that the metal will be found specially suited to mosquito netting. The difficulty of securing a sufficiently fine gauge of aluminum wire is, however, said to be an obstacle to its use in this and other fields at the present time.

SHEET METAL WORK.

Making the Bottom of a Bay Window.

A correspondent writing from Reading, Pa., asks if there is a rule for making the bottom of a bay, as shown in the sketch, and such being the case he will be glad to see the drawing. The sill molding, he says, is made the same as all circle molding, and he worked the bottom of the bay over a skeleton frame, and when finished took the frame out, leaving the metal shell, after which he fastened it to its place. He desires to know if there is a better way of doing the work. In reply we would state that the plan and elevation shown herewith are reproduced from our correspondent's sketch. A B D E is the front elevation of the sill molding, shown in side view by K, and B D C is the front elevation of the bottom of the bay, I K J being a plan view showing the curve struck from the center H. As the front of the bottom of bay must have the shape indicated by B C D taken on the line I J in plan, it will be necessary to establish a true section on the line S K in plan from which to obtain the radii for blanks or patterns. To obtain this true section proceed as follows. Divide the curve D E into any number of spaces, as shown by the small figures 1 to 6. From these points and at right angles to B D drop lines as shown, intersecting the wall line I J at points 1^1 to 6^1. Then with H as center and radii equal to H 6^1, H 5^1, &c., draw arc intersecting the center line S K, as shown from 1^2 to 6^2. At any convenient point opposite the front elevation draw any vertical line, as T U. Now extend the lines from the points in the profile E D C until they intersect the vertical line T U, as shown. Now, measuring in every instance from the point S in plan, take the various distances to the numbered points and place them upon lines of similar numbers, measuring in every instance from the line T U in section. Thus take the distance S K in plan and place it as shown from the line T U to K ; then again take the distance from S to 1^2 in plan and place it as shown from the line T U to 1^2 on the line 1 in section. Proceed in this manner until all the points in the true section have been obtained. Trace a line as shown, when 1^2 6^2 Y will be the true section on the line S K in plan.



Making the Bottom of a Bay Window.—Plan, Elevation, True Section and Method of Obtaining Radii for Blanks.

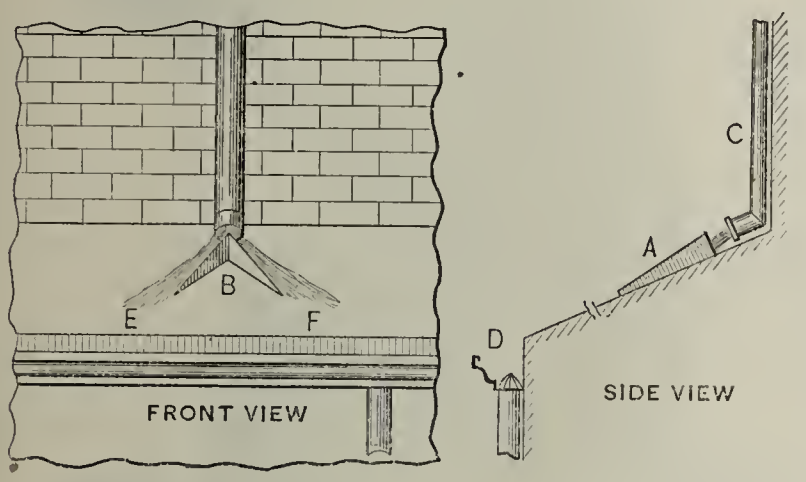
For the patterns or blanks proceed as follows. It should be understood that the usual method for making

the bottom of bays round in plan is to divide the profile of the molding into such parts as can be best raised or stretched. Assuming that this has been done, take the distance from 1^2 to H in plan, and place it as shown by 1^2 to L in section. From the point L draw a vertical line, L N, as shown. For the pattern for the mold 1^2 2^2 in section average a line through the extreme points, as shown, and extend the same until it meets L N at N. Then with N as center and N 2^2 and N 1^2 as radius describe the blank, as shown. The other blanks are obtained in precisely the same manner. The lower portion shown from 5^2 to 6^2 is a straight strip stretched as required. The upper or convex molds will be raised either by hand or machine. If by hand use the raising hammer and block. The lower or concave mold will be stretched by machine or hand, using the stretching hammer and stake. A model should be made to which to raise and stretch the work. This model may be made as follows : If the bay is large, draw the elevation of the bottom of bay on the floor and put in the various horizontal lines 2, 3, 4, 5 and 6, also the center line X C, upon which place the true section 1^2 Y 6^2. Now upon the various horizontal lines 2, 3, 4 and 5 place sections of similar numbers shown in plan. Then upon this model the molds will be raised or stretched to conform to the various sections. Tack the joints or seams, take it off the model, rivet and soak with solder. Allowance for lap should be made on all patterns.

WATER SPREADER FOR STEEP ROOF.

BY W. N.

It is often the case that the rain water from an upper roof is drained through leaders on to a lower roof. When the latter is very steep and the upper roof has a large surface



Water Spreader for Steep Roof.—Fig. 1.—Front and Side View of Water Spreader.

the rain water in a storm or shower rushes through the leader and out of the elbow, shown at C, Fig. 1, and in some cases the force of the rush not being broken it is apt

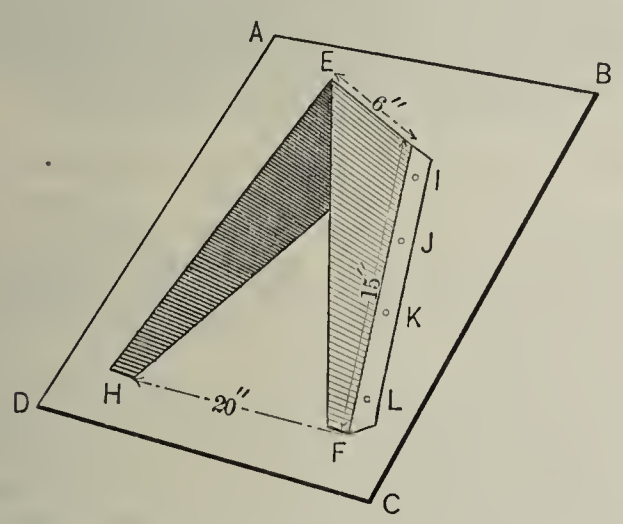


Fig. 2.—General View of Water Spreader as it would Appear on a Steep Roof.

to flow or spray over the gutter D, shown in the side view. To avoid this and to break the rush of the water there is shown in Fig. 2 a view of a water spreader with dimensions. The spreader is riveted on a sheet of tin, copper or sheet iron, as required. If the roof is of tin or copper a lock is edged on to the sheet A B C D and laid in with the courses, while if the roof is of slate or wood shingles the spreader is fastened to heavy galvanized sheet iron and slated in with the courses. E F H represents the spreader, being 6 inches high, 15 inches long and having 20-inch spread, and is riveted at I J K L on each side. In Fig. 1 is shown the method of placing the spreader in position, A being the spreader in side view and B in front view. The water rushing through the leader C is cut by the spreader, throwing the water in either direction at E and F, then flowing into the gutter D.

TINSMITHING FIFTY YEARS AGO.

Through the courtesy of John D. Ottiwell, 199 Third avenue, New York City, we are enabled to present a portion of a list that was of great interest to tinsmiths in New England a half a century ago. To many in the trade some of the items will not be understood, the ovens mentioned being similar to what many have heard of as tin kitchens. The dish kettles with pewter bottoms were made in the usual way and afterawrd reinforced on the inside with a heavy coating of pewter, so as to better stand the wear and tear of dish washing and the contact with plates and crockery. The 20 stoves which a man was supposed to make in a day were foot stoves—that is, tin water cans intended to be filled with hot water and provided with an opening for filling, which was stopped with a cork. The lanterns referred to in this case did not consist mostly of glass as the lanterns of to-day, but the light was shed through openings cut with what was known as a lantern chisel or punch, having a cutting edge about ¾ inch long and ⅛ inch thick, making a slot that was oval in shape. It will be noticed that the price is given in English money—shillings and pence. This list slightly differs from the list that was used in the South, which it is possible some of the older workmen of the South have in their posession and which would interest the readers of *The Metal Worker* if it could be reproduced.

Mr. Ottiwell, after serving his apprenticeship, worked in many of the Southern States, going down the coast until he reached New Orleans and then up the Mississippi River, working in several of the larger towns, and he is familiar with plantation life of the early period. From the Mississippi River he came east to Pittsburgh and over the Alleghany Mountains previous to the building of any railroad. He established his present business at 199 Third avenue in 1851, and has furnished us the following bill of days' work that was used in New England, having copied it from a list owned by a fellow workman in 1844:

Bill of Days' Work and List of Prices for Plain and Japanned Ware for New England.

	⌐Selling price.¬ Shillings.	Pence.
3 large ovens	20	0
4 second size	18	0
4 third size	16	0
6 fourth size	12	0
16 large dish kettles (bottoms pewtered)	5	6
16 large dish kettles (without pewter)	5	0
10 water pots	4	0
18 large pails	4	0
18 large pans	4	0
20 stoves	4	0
24 10-quart pails	3	6
24 10-quart pans	3	6
18 gallon coffee pots	3	6
18 large covered pails	3	6
18 large saucepans	3	6
24 gallon measures	2	4
30 6-quart pails	2	4
30 common size milk pans	2	4
24 large wash bowls	2	4
20 lanterns	2	4
24 small dish kettles	2	4
20 cullenders	2	4
24 large milk strainers	2	4
24 3-quart coffee pots	2	4
24 large pudding bags	2	4
24 roasters	2	4
40 lantern frames	2	2
20 3-quart covered pails	2	0
24 small wash bowls	2	0
24 saucepans	2	0
30 ½-gallon measures	1	6
48 bean pans	1	6
72 graters	0	7

In his journeyman days Mr. Ottiwell remembers distinctly being called upon to heat a conservatory attached to the mansion of a customer, and, as there was no chimney or opportunity for using a stove in the conservatory,

the first example of hot air furnace heating he ever saw was planned for the work. A large cast iron stove was encased in brick work and pipes run from the chamber to the conservatory. This hot air system was in use for several years, giving satisfaction. Mr. Ottiwell also, with the assistance of a fellow workman, received one of the first hot air furnaces that was shipped from Connecti cut to New York at Peck slip, and set it up in a hotel building near where the United States Express Company's present office is located on Broadway. This was previous to 1844.

EMPLOYERS' ASSOCIATION OF ROOFERS AND SHEET METAL WORKERS.

As a result of several well attended meetings held during December and January by the manfacturers of builders' sheet metal work in New York and adjoining cities, it was decided to take out articles of incorporation. A certificate of incorporation was therefore filed in the County Clerk's office, at New York, on Wednesday afternoon, February 2, of the Employers' Association of Roofers and Sheet Metal Workers of Greater New York and Adjoining Cities. The certificate, which was signed by Justice Freedman in the Supreme Court, sets forth that the association is organized

To foster the trade and interest of manufacturers of sheet metal roofing, cornices, skylights, corrugated iron work, ventilating and heating pipes, and all other sheet metal work ; to reform abuses relative thereto, to secure freedom from unjust and unlawful exactions, to diffuse accurate and reliable information as to matters connected with the trade, to secure uniformity and certainty in the customs and usages of said trade and commerce, and of those interested therein ; to settle differences between its members, and to promote a more enlarged and friendly intercourse between business men in said trade.

The incorporators of the new association are Jacob Ringle, Jersey City, N. J.; John Seaton, Brooklyn; George Hayes, Chas. T. Galloway, John Morrow, James Smith and John J. Grace of New York.

At a recent meeting the following officers were elected:

President, George Hayes.

Viee-President, Chas. T. Galloway.

Seeretary, J. R. McAfee.

Treasurer, Frank P. Cunningham.

A meeting of the incorporators will be held Tuesday, February 8, when an Executive Committee will be appointed, and at that meeting a call will be issued for the first regular meeting of the new association, to which all manufacturers of builders' sheet metal work will be invited, with a view of learning the objects of the association and the benefits that are expected to be gained by membership.

FLASHINGS.

A large poster distributed by the Ferracute Machine Company, Bridgeton, N. J., and known as Sheet 30, presents illustrations of an extensive variety of Foot and Power Presses which they manufacture.

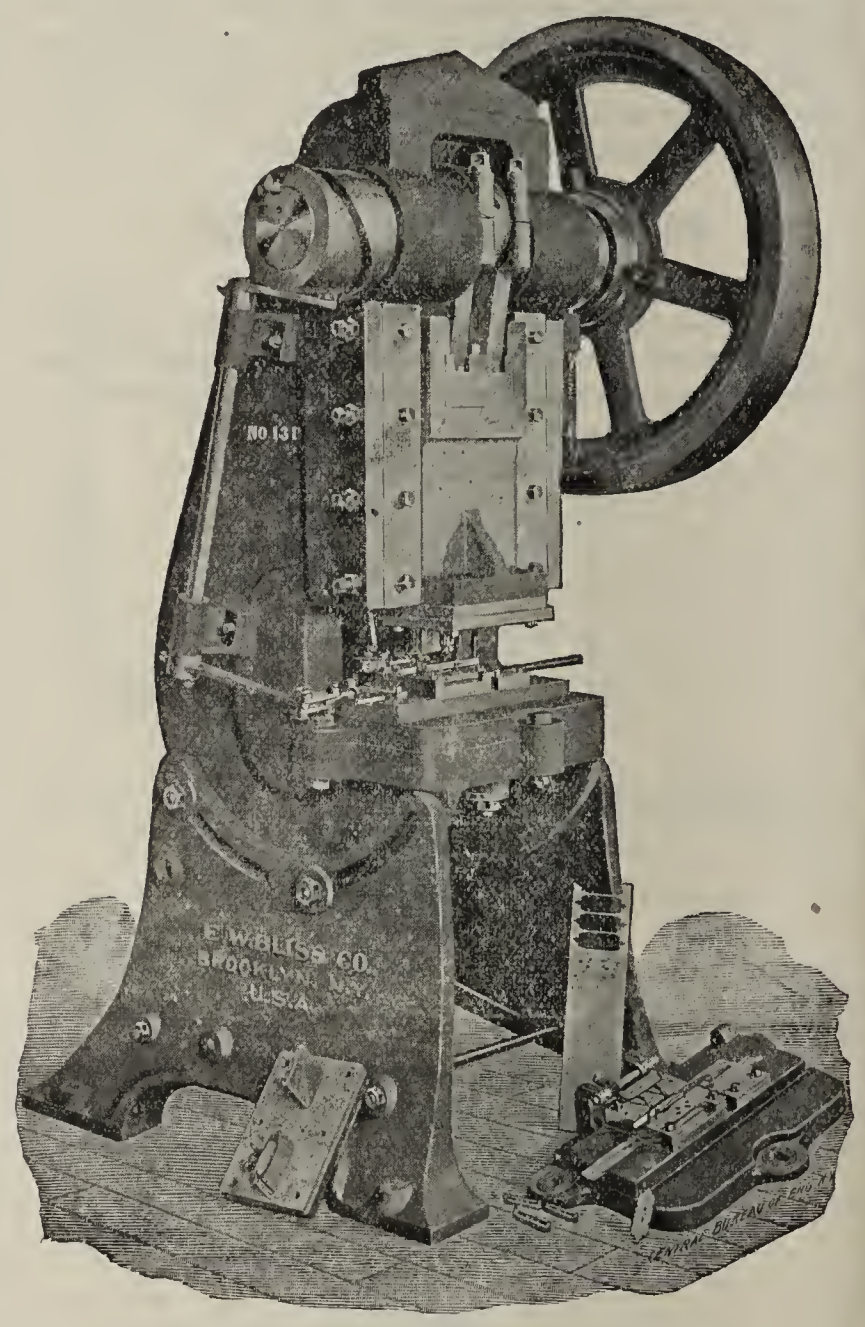
The Youngstown Iron & Steel Roofing Company, Youngstown, Ohio, have increased their capital stock to $50,000, and intend putting up an addition to their building, as they have recently made arrangements for the manufacture of Expanded Metal Lathing, Fire Proof Flooring and Bridge Flooring, and expect to do quite a large business in this line, in addition to their regular Corrugated and T and C Metal Lath. The business outlook they report to be decidedly promising for the coming year.

Marlin & Co., Incorporated, Liberty avenue and Twenty-fourth street, Pittsburgh, manufacturers of Conductor Pipe, Eave Troughs and Skylights and Cornices, have been awarded a contract for a large lot of roofing, skylight and ornamental cornice work for the new Market House to be built in the East End, Pittsburgh. The contract is one of the largest of the kind given out in Pittsburgh for a long time, and competition to secure it was quite keen. Marlin & Co. have numerous other orders on hand and are running their shops full time.

Pittsburgh was chosen Wednesday as the meeting place for the biennial convention of the Amalgamated Association of Sheet Metal Workers. The Executive Board of the association is now in session on the South Side, arranging for the event and discussing ro utine matters. The board is constituted as follows: President, H. H. Brauch, Peoria, Ill.; secretary, James Hughes, Pittsburgh; vice-presidents, F. C. Cole, Ithaca, N. Y.; M. F. Gilmore, Toledo, Ohio; J. H. Kennedy, Toronto, Ohio, and H. A. Daniel, Lexington, Ky. Wednesday the board visited the various tin plate factories and in the evening the officials were banqueted at the Hotel Jacobs. The organization has a membership of about 5000.

The Stiles Open Back Press With Push Feed and Finger Gauge.

The machine illustrated in the accompanying cut has been designed and built by the E. W. Bliss Company (owners and operators of the Stiles & Parker Press Company), 16 Adams street, Brooklyn, N. Y., for cutting, perforating and shaping at one and the same handling the lock cases used on satchel frames. It will be understood that the operator pushes the metal strip into the die against an automatic finger gauge, which permits of running the press continuously. After the piercing and punching operations, which are done in a double die, the blank is moved sideways into the forming die, which finishes it and drops it out of the press at a rate of about 60



The Stiles Open Back Press with Push Feed and Finger Gauge.

to 80 per minute. Similar feeds can be applied to other presses and are extensively used in the manufacture of belt hooks, tobacco tags, staples, &c., &c. Sometimes a roll feed is used in addition to the feed illustrated for feeding the stock.

The principal dimensions of the press as shown are as follows: Size of opening in bed, 5 x 12½ inches; width of opening in back, 15 inches; distance back from center of slide, 5½ inches; distance from bed to bottom of slide when up, 9⅜ inches; standard stroke of slide, 1½ inches; adjustment of slide, 1 inch; diameter and face of fly wheel, 38 x 5¼ inches; speed of fly wheel, 100 revolutions per minute; weight of fly wheel, 725 pounds; distance between gibs, 11 inches; total weight, about 3300 pounds.

An appropriation for the establishment of a Government powder factory for the manufacture of smokeless powder for the naval service is to be asked for from Congress in the naval bill now in preparation. This step will obviate the present difficulty of obtaining a sufficient supply of smokeless powder at short notice from private companies.

HEATING AND PLUMBING.

The New President of the Heating Engineers, ——Wiltsie F. Wolfe.——

The new president of the American Society of Heating and Ventilating Engineers is well known to many of our readers who recognize Wiltsie F. Wolfe in the portrait which we present. Mr. Wolfe was reared in an atmosphere alive with ideas on heating and heating apparatus, having been born in Troy, N. Y., on October 24, 1854. On March 6, 1870, he entered the employ of his father, who was a member of the firm of Hicks & Wolfe, Troy, N. Y. Here he became engaged in solving the problems of church heating with hot air furnaces, a branch of business to which the firm gave special attention. Since that time he has had a number of connections with manufacturing houses in the heating business, and for several years has made a special study of school house heating, in which field he has achieved an enviable success and reputation. Last year he formed the Wolfe Warming & Ventilating Company, Exchange Building, Boston, Mass., of which he is the president. His study in this field has led to several inventions for controlling heating and ventilating systems which he has patented. In New England, and in Massachusetts particularly, where there are stringent laws governing ventilation, he has had notable success in heating and ventilating school buildings, and in Baltimore, Md., also, plants that he has designed and installed are representative of the best systems in use. Mr. Wolfe is possessed of all the qualities for advancing the interests of the society, and the members have done well to place its affairs in his hands.



WILTSIE F. WOLFE.

The Call for the New York State Convention.

The call for the annual convention of the New York State Association of Master Plumbers has been issued by Secretary C. F. Fisher, over the signature of the president, W. G. Reed. The convention will open on Tuesday, March 8, in the city of Binghamton, and the headquarters will be at the Hotel Bennett, on Washington street. The call is accompanied by a credential blank, so that the different associations may fill out the names of the delegates and alternates and hand them in. The call is also accompanied by a notice that the per capita tax is now due and the statement that each association is entitled to one delegate for each ten members or fraction thereof, in addition to the president, who is a delegate by virtue of his office.

The specifications in a contract for public work in the city of Boston stated that union labor should be preferably employed. The contractors who received the contract did not employ exclusively union men, and in consequence an attempt was made to nullify the contract, and on suit the court holds that the Mayor did not terminate the contract, it being still in force. In his decision the judge said: "The court finds that the preference for union labor is without authority in law for the forcing of such discrimination between workmen in respect to the privilege to labor on public work which is paid for by taxes levied upon all. This discriminating clause is void. It is against public policy and is in violation of the State constitution and not in accord with the ideas of a government founded on equal rights, and it is inconsistent with an impartial administration of public business. It creates an unlawful and unconstitutional class privilege."

The Pierce, Butler & Pierce Mfg. Company.

An announcement has been received from the Pierce, Butler & Pierce Mfg. Company, Syracuse, N. Y., relating to the steam and hot water heaters heretofore manufactured by them for the American Boiler Company. The Pierce, Butler & Pierce Mfg. Company will now not only manufacture but sell in the East the entire line of steam and hot water heating apparatus formerly sold by the American Boiler Company. The trade in the West will be looked after by Kellogg, Mackay & Cameron from 84 Lake street, Chicago. The New York office, at 94 Centre street, will be under the management of F. T. Bassett, Jr., and the Philadelphia office in charge of W. H. Peterson. The announcement states that two new constructions will soon be presented to the trade, one being a round sectional boiler for steam and hot water, and the other a vertical sectional boiler. It also points out that the company manufacture a complete line of steam and water radiators in all hights, of first-class workmanship, handsome design and efficient operation. They call special attention to the fact that they will carry ample stocks at the New York, Boston and Chicago houses to insure prompt deliveries to their customers. They refer to their new and extensive plant and its equipment with modern machinery so that they can produce high grade goods at the lowest possible prices and say they are prepared to deal generously with the trade. The company have had long experience in the manufacture and sale of boilers and have already established for their goods a wide reputation which aids the local contractor materially in making sales. A new catalogue is in course of preparation, which will be sent as soon as completed to those who apply for it. At the New York house, Manager Bassett has rearranged the office and showroom. Samples of the various boilers are at the front attractively decorated so that their construction may be examined and their operation explained. In the rear of the samples is the general office where catalogues and information can readily be secured by the trade. The back portion of the building is reserved for carrying a light stock of various parts of the goods made by the house and such trimmings as are needed by the trade. Here Manager Bassett has a private office, which seemingly will be of little use in view of the open and courteous treatment accorded the customers of the company.

Col. William T. McGurren, president of the Michigan State Association of Master Plumbers, issued a call for the annual convention of the association and Secretary W. E. Weatherby has sent out notices announcing that the meeting will be held at Lansing, February 15 and 16.

NATIONAL EXECUTIVE COMMITTEE MEETING.

CHANGE IN DATE OF CONVENTION.

A meeting of the Executive Committee of the National Association of Master Plumbers was held at the Revere House, Chicago, January 25, and 26, all members of the committee being present with the exception of C. C. Dewstoe and J. L. E. Firmin. The date of the convention was changed from June to April 13, 14 and 15, 1898. This was on account of the fear of many members that it would be too hot at San Antonio, Texas, the place selected for the convention, in June. Mr. Braden, the member of the Executive Committee from San Antonio, said April would be the best month of the year. Mr. Braden has been assured of one fare for the round trip and has hopes of doing even better. Mr. Braden read a paper dealing with the condition of the trade in his territory, which was in part as follows:

Texas, that little isolated spot upon the map whose growth was prematurely checked by the Gulf of Mexico, the Republic of Mexico and the Llano Estacado, greets you through her humble but earnest representative. I am glad that the committee met in this city. I believe every one has a desire to come to Chicago. We Texans particularly have a fellow feeling for the people of Chicago, because we are the next biggest thing on the map. You should have a fellow feeling for us because we keep you in meat. We do more than that for you. We send you the porterhouse and the tenderloin, and keep the horns, hoofs and tails. It is a solemn fact that you can get a better piece of Texas meat in Chicago than you can in Texas, which is a positive proof that we give you Chicago people the best of it. Since you fellows are coming down to visit us this year, we are not going to send all our good meat to Chicago; we are going to keep enough choice Texas steers to feed the delegates.

I am here not only as a member of the Executive Committee of the national association, which honor I fully appreciate, but also as president of the Southern League of Master Plumbers, the birth of which I believe marks a new era in the history of the plumbing business. We organized as thoroughly as possible under the national. We got everybody in but a few plumbers in the border cities. We were all members, for the most part friendly socially, but deadly enemies commercially.

To sum up, we murdered the business of plumbing and were fastening the crime upon our children. This was what Texas, one of the best organized States in the national, was doing. We began to think. There was no longer any money in the plumbing business. We had time to think. The result was the Southern League of Master Plumbers for the prevention of disease. In just seven months we opened the doors of the Legislature and secured the Texas State law. We had trade protection under the national because Texas was thoroughly organized, but we found that trade protection was only one of the very many things we needed, that trade protection without business harmony and co-operation did not add one dollar to our plumbing profit nor one iota to our standing among the people.

Instead of combining to put up the price of work we have been combining to perpetuate cheap and dangerous plumbing in which there is neither profit nor honor. A glance at *Dun* or *Bradstreet's* reports should convince the people that no money has been made in the plumbing business for a number of years outside of the very large cities. And even here, in Chicago, and in New York the rank and file have properly felt the grip of this era of relentless competition. The honest plumber has this excuse for the deplorable condition which I sketch. The people condemn the modern plumber without taking into account the wonderful improvement in method and appliances, and this ignorance of the public regarding the progress of sanitary plumbing has forced the honest plumber to do what we designate as "skin work" in localities where there is no law or inspection. A short time ago we were ignorant of these things, and that was an excuse, but in the light of modern progress we have learned the relation of plumbing to health, and if we do not formulate methods to protect the people from the dangers of defective plumbing and drainage we will be classed as criminals.

In this connection I desire to state that the most ridiculous charge to which we are subjected in our efforts to remedy some of these deplorable conditions by sanitary law is that the law we urge is believed to be a gigantic swindle imposed upon a long suffering people by a shameless combine. This would be funny if it were not pitiful. We plumbers know that the absence of law and inspection gives us every opportunity to defraud and rob the people by means of cheap labor and defective material, while the right kind of State law, examination, registration and inspection makes such deceptions impossible. Now, if our association was a combine for revenue only the last thing on earth we would want would be a law which prohibited the use of unskilled labor, defective, second hand or very cheap material. This fact is so apparent that I am astonished more and more every day that the people who oppose the provisions of our new Texas State law do not see it. If the Texas State law were enforced to the letter to-morrow and the plumbers should continue their reckless, cut throat, antagonistic methods, there would not be a plumber in Texas 12 months from to-day. They would sink every dollar they could borrow or beg so deep that there would be no possible hope of business resurrection.

Now, gentlemen, the suggestion that Texas has to offer this committee is that you study the plan which will save us from ourselves if we follow it. You have in the North and West the same troubles in a greater or less degree that we have in the South. The Inter-State League organized a wheel within a wheel for better trade protection; you got it. Are you perfectly satisfied with it? Is there nothing more you would like? We know there is. You need harmony and business co-operation and the right kind of sanitary law as much as we do. Each member of this Executive Committee has been supplied with literature which fully describes our methods, purposes and accomplishments. As president of the Southern League of Master Plumbers, I call your attention to this matter again in the interest of the whole craft, and I urge you with all the earnestness of my nature in behalf of the struggling plumbers of the United States to carefully go over this plan, as a committee, with a view to its adoption as the future basis of work for the national association.

The Weiskittel Lavatory.

In the engraving presented herewith we show a new cast iron white enameled lavatory which has just been placed upon the market by A. Weiskittel & Son, Baltimore, Md. These lavatories are made in two styles, one as shown in the engraving and another designed for use in a corner. In both instances the bowls are oval, and the bowl, slab and back are all cast in one piece, then thoroughly covered with a pure white porcelain enamel. This avoids all joints and crevices and makes a thoroughly clean and sanitary fixture. The house are also making a full line of fine porcelain enameled baths and other enameled iron plumbers' goods. They are preparing a special catalogue of these goods, and can furnish circulars of many other specialties to those who apply in the meantime.



The Weiskittel Lavatory.

Achilles P. Deily, city plumber of Allentown, Pa., died at his residence recently of paralysis of the heart. After learning the plumbing trade with Evans & Seagrave of that city he was elected city plumber by the Water Board, a position which he held for several years. He is survived by a widow and four children.

Heating and Ventilating Church and Parish Building by Forced Draft.*

BY B. H. CARPENTER, WILKES-BARRE, PA.

In designing and carrying out this system it was necessary, in order to insure its success, to obtain the following results: 1, to heat the buildings by the gravity system at all times; 2, to heat and ventilate the buildings when necessary by mechanical means; 3, to avoid drafts of any nature; 4, to prevent objectionable noises. Under the first head there were several features to contend with. The basement was but 6 feet in hight, and in order to get the proper elevation between the steam coils and the water line in the boilers it was necessary to excavate to a depth of 6 feet and set the boilers on the concrete 12 feet below the joists. By using coils 4½ feet high I was enabled to get 22 inches between the water line of the boilers and the bottom of the coils.

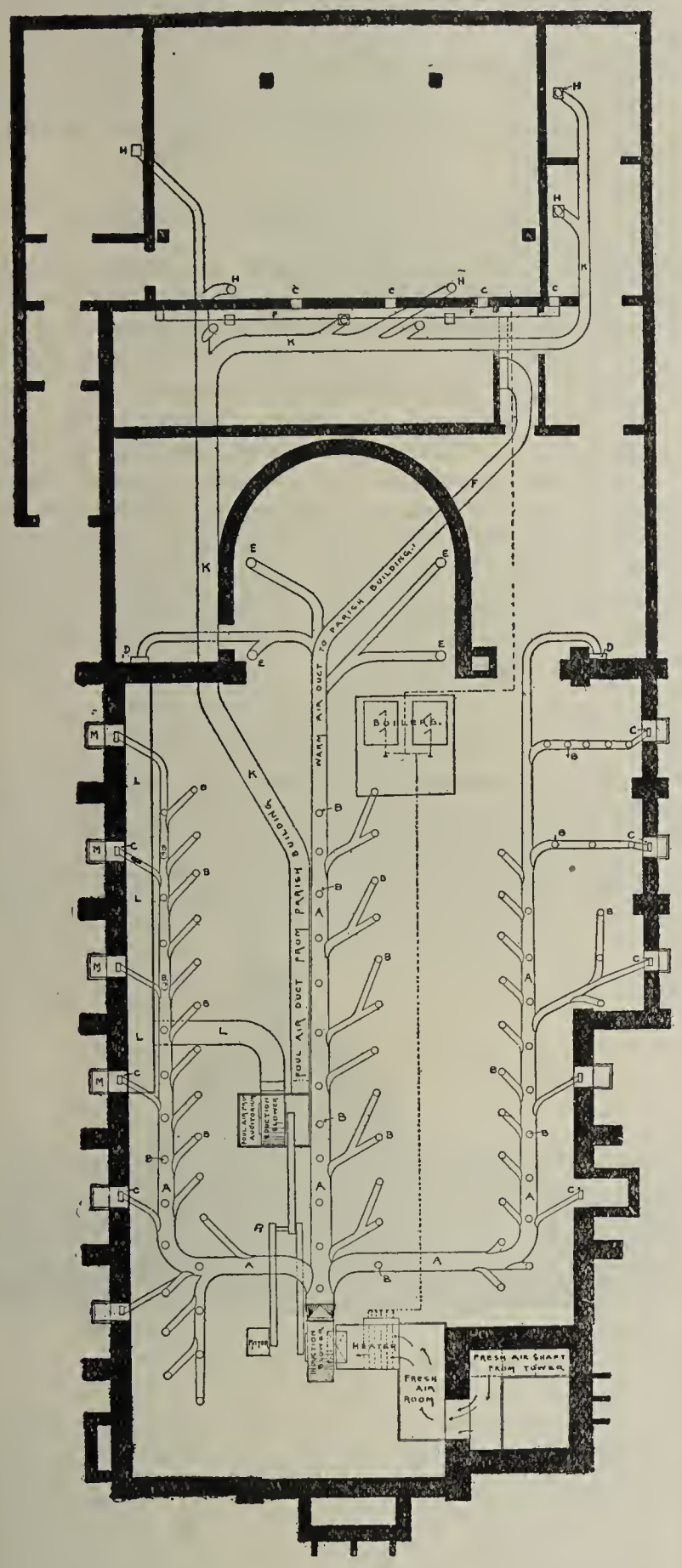


FIG. 1.

The chimney was located at one end of the building, while the fresh air inlet was at the other end of the building, about 80 feet away. This would necessitate either a long smoke pipe, a long fresh air duct or a long steam pipe. The last mentioned was thought most feasible and the apparatus was so planned, with boilers near the chimney and the heater near the fresh air inlet, enlarging the steam and return pipes, in proportion to the distance, to overcome friction.

The boilers used were of the cast iron sectional type, two in number, each having 13 sections. Each section was rated at 270 square feet capacity, making a total capacity of 7000 square feet. A 24-inch smoke pipe of No. 12 iron connected the boilers to the chimney, which was lined with 24-inch square terra cotta flue lining. The

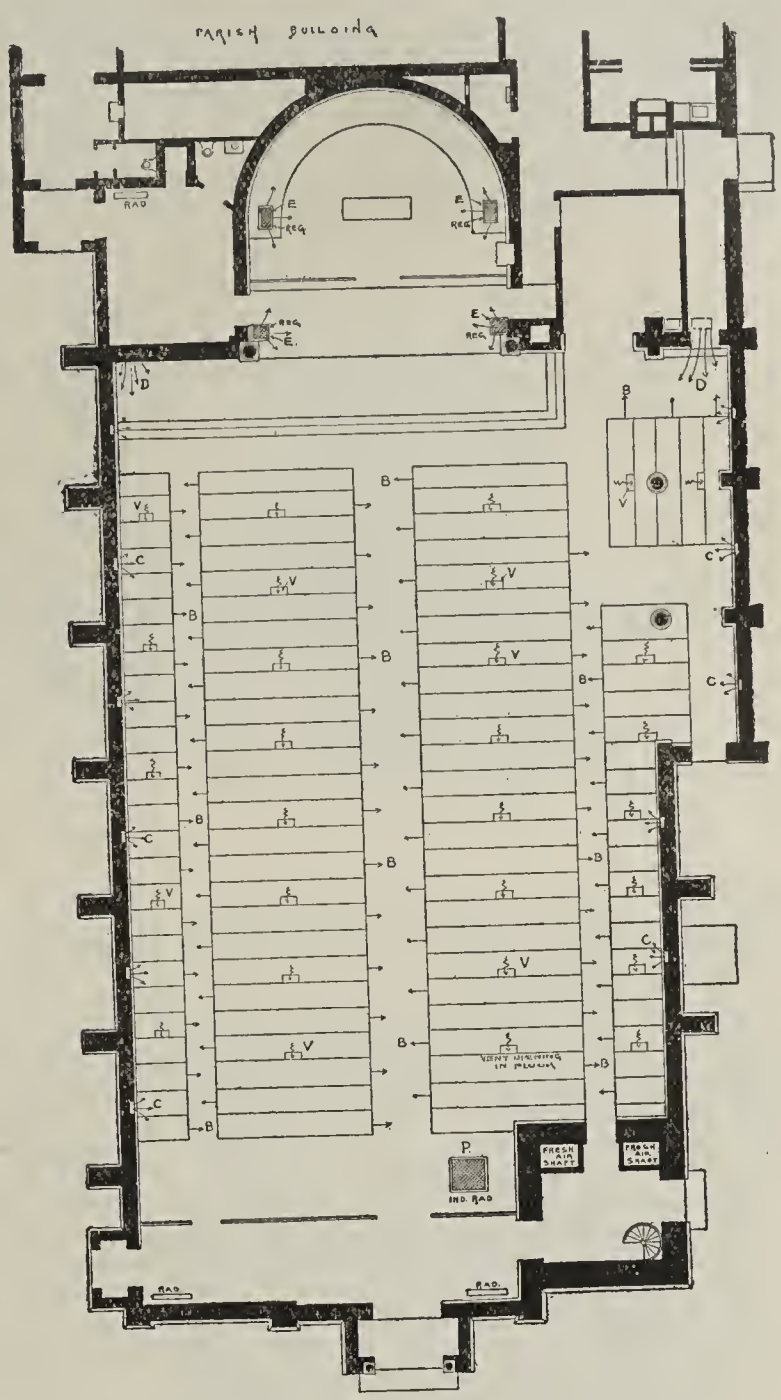


FIG. 2.

piping from the boilers was run as shown on the accompanying plan, Fig. 1, and was so arranged with valves that either or both boilers could be put in service.

The heater, composed of 5000 feet of heating surface, was divided into six equal divisions, each part being valved at feed and return and supplied with an automatic float air valve. Above the heater and at one side was placed a register, P, Fig. 2, connected to the heater by a wooden register box lined with asbestos, to convey the heated air to the room above when the fan is not running. This box has a tight slide or valve with which to cut off when the fans are running.

The vestibule and vestry are both heated by direct radiation. In the vestibule are two radiators, each having 100 square feet of heating surface. The parish building in the rear of the church proper is not a new building. It was formerly heated by direct and indirect radiation, with an attempt at ventilation, which was a failure, though the heating was successful. This building was supplied with a wrought iron steam generator, which I abandoned, connecting the piping system, after some minor changes, to the new boilers. The radiation was not disturbed. The piping above ground in the basements is all protected by asbestos sectional covering. The pipes underground are incased in wooden boxes.

Our second point was to ventilate when necessary. To do this two three-quarter housing steel plate pulley fans were installed, the induction fan being 110 inches diameter and the eduction fan 100 inches. The induction fan draws the air down from the flues in the tower, as shown in Figs. 1 and 2, where it enters the tower at a hight of 80 feet from the ground. The air then passes over the heated coils in the heater and thence is either driven through the galvanized iron ducts A A A to openings into auditorium or, if desired, is forced through the main center duct A to duct F, which conveys the air to the parish building. The eduction fan draws the air from

*Read at the New York meeting of the American Society of Heating and Ventilating Engineers, January 25-27, 1898.

the auditorium through openings V in the floor, or from the parish building through openings H and duct K, at will. and drives it through duct L to openings in the side wall M, whence the air is thrown outside the building.

The warm fresh air passes into the auditorium through 87 8-inch ducts, B, to openings in pew ends; also through 11 5 x 12 inch flues, C. leading to 10 x 12 inch registers in side walls; also through two 8 x 24 inch flues, D, leading to 20 x 24 inch registers in end wall and four 20 x 24 inch registers, E, in chancel. The air, by passing through pew ends at a velocity of 5 feet per second, through wall flue C at 8¼ feet per second, through flues D at 8¼ feet per second, and through floor registers E at 6½ feet per second, furnishes a total of 20,300 cubic feet per minute to the auditorium, which gives 1000 persons (the seating capacity of the auditorium) 20 cubic feet each every minute, a sufficient volume, at its maximum

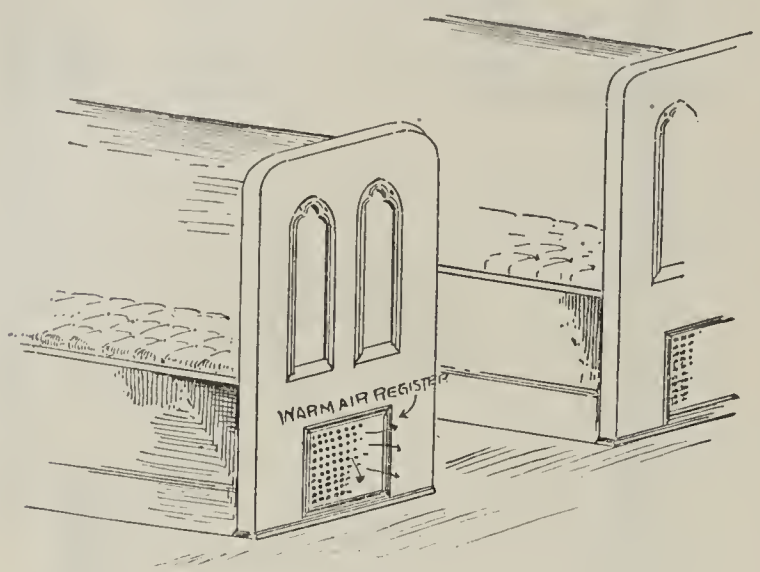


FIG. 3.

speed, to change the whole body of air in the auditorium every 12½ minutes.

It was the purpose of the system to heat but not to ventilate the church and parish building at the same time. Valves were provided where necessary to cut the air off from auditorium and force it through duct F to the parish building. When the air is being forced into the parish building the valve in the duct K is opened and the door O closed, and the air is drawn from the parish building and forced outside. The parish building was furnished with fresh air through duct F. thence through rising duct and through four registers, C, located 16 feet above the floor. The air is drawn down through eight floor registers, H, into the duct K and carried back to the eduction fan. The ducts are proportioned according to the amount of air passing through them necessary to ventilate the various rooms.

In order to avoid drafts in the auditorium the air was brought into the room, as well as expelled from the room, through the large number of openings, and by having the pipes of sufficient size the air was driven at a slow speed. The openings C in the auditorium are placed under the windows to counteract the currents of cold air falling from the windows.

The fourth point was to prevent objectionable noises. The fans are driven by a 12½ horse-power electric motor of the four-pole type, running at a speed of 900 revolutions per minute. The motor drives the countershaft R, which is belted to the two fans. A resistance coil is placed in connection with the motor in order that its speed can be varied at will to suit the requirements. The fans, the motor and the countershaft are all bolted to planks, these being bolted to brick and concrete foundations. To prevent the carrying of vibration from fans to ducts all connections between them are made with canvas and asbestos cloth.

The openings D and E in the chancel end of the auditorium are of good size and evenly distributed in order that the large volumes of air which are introduced through them may convey more clearly the sounds of the human voice and the tones of the organ to the congregation. By the use of the mechanical system the buildings can not only be heated in winter, but may also be cooled and ventilated in summer, the air being drawn down through the tower and coming in contact with the thousands of feet of cold piping before entering the auditorium.

Up to the time of going to press with this paper the system, as far as tested, has proved to be mechanically correct. Pea, or No. 6, coal is used in the boilers and the buildings are well heated. At the opening of the church, on Christmas day, with the outside temperature at 10 degrees above zero at 7 o'clock in the morning, the air in the auditorium was kept at 68 degrees with but two of the steam coils turned on, the circulation of air being very good.

Standard Radiator Mfg. Company.

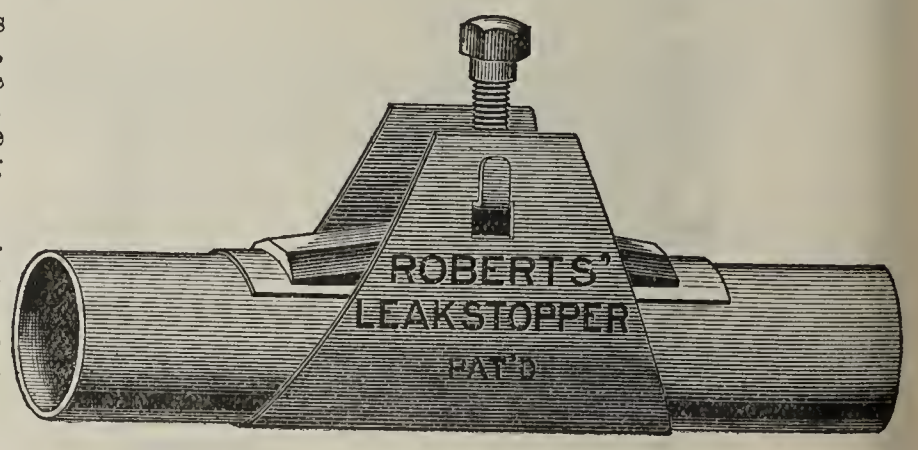
The New York office of the Standard Radiator Mfg. Company, Buffalo, N. Y., has undergone a complete rearrangement and redecoration in the hands of Manager John I. Leitch, who again extends an invitation to the steam and hot water heating trade to look over the standard line of radiators at 206 Centre street. A handsome new carpet is on the floor and the walls and ceiling have been frescoed in mellow tints. An aisle is formed through the showroom by the arrangement of the radiators on exhibition. A very pretty effect is gained by grouping the single column radiators in the foreground with the two, three and four column standards for steam and for hot water behind them. The low radiators are near the asile and the radiators increase in hight toward the wall. The effect is varied by the radiators being decorated in different tints and colors and the relief portions being finished in gilt or color. Some of the radiators for both hot water and steam are made with entirely plain surface, giving a high efficiency in service and by the contour and appearance that will harmonize with fine furniture. For heating the office a four-column standard steam radiator is used, tapped for the supply and return on the same end to show one of the many special forms of connections for which the line is adapted.

Newark, N. J., Plumbers' Smoker.

At the last regular meeting of the Master Plumbers' Association of Newark, N. J., in January, the committee appointed to arrange for a smoker reported that it would be held in Achelstetter's Hall, at 852 Broad street, on February 16. The committee in charge is A. S. Walker, William Jacobi, F. J. Stern, Robert Berla and L. Stephens. Invitations have been issued to the Master Plumbers' Associations in Paterson, Passaic, Bayonne and Jersey City, and a special invitation has been sent to State Vice-President John Hickman of Paterson. The Newark association is noted for the social feeling existing among its members, and in the hands of this committee it is a foregone conclusion that the smoker will be an event to be remembered.

The Roberts Leak Stopper.

In the accompanying illustration we show a leak mender put on the market by George I. Roberts & Bro., 473 Fourth avenue, New York. It is made in three different sizes, adapted for all sizes of pipe from ½ to 2½ inches in diameter. It is designed for stopping leaks in pipes used for conveying steam, water, gas or sewage,



The Roberts Leak Stopper.

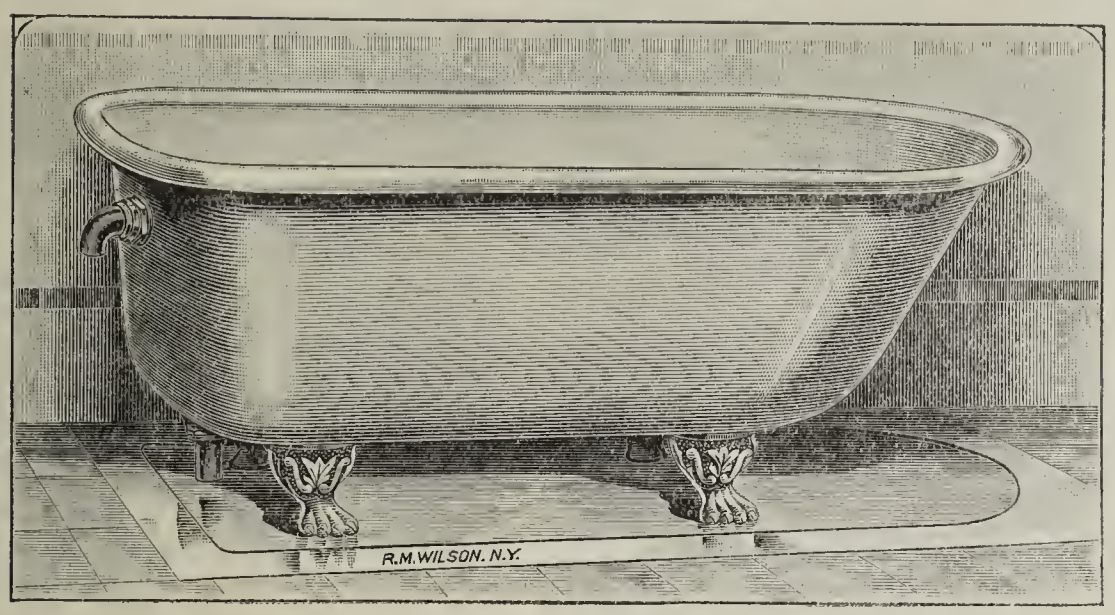
until the damaged piping can be replaced, and is recommended for emergency work. It consists of a specially prepared rubber strip, a malleable iron plate for holding the strip to the pipe and a strap which encircles the pipe. The strap is provided with slots for the ends of a casting, which is tapped for a set screw to force plate tightly against the rubber strap and the pipe. The plumber, steam and gas fitter will find these leak stoppers a very convenient appliance to carry in the repair kit.

We have received from the Ideal Mfg. Company, Detroit, Mich., circulars printed in two colors showing halftone engravings of their No. 1 and No. 2 Low Tank Closet Combination. The engravings show their Sileo and different closets using Low Down Tank Combinations of different styles of finish and design. This combination avoids the necessity of a flush tank near the ceiling, and in connection with the Sileo the closet is said to be flushed with a noiseless double flush, so that its entire surface is thoroughly scoured. It is pointed out that the combina

tion is free from complication and is not liable to get out of order. Over 1000 are said to have been put into active operation and demonstrated their merit.

New Enameled Baths.

One of the latest firms to engage in the manufacture of white enameled cast iron bathtubs are the R. M. Wilson Mfg. Company, Rome, N. Y. Having established a reputation in the trade for solid copper and copper lined wood tubs and plumbers' goods, the company have completed their line of bathtubs by the addition of a plant for the manufacture of high grade enameled baths and other plumbers' enameled ware. In the accompanying illustration we show the Rome Special, one of their finest bathtubs, which is furnished in all the usual styles and sizes and adapted for the use of the various styles of supply and waste fixtures. The Rome Special tub is made with a 2½-inch roll rim and the ends have a graceful sweep in rounding to the sides. The Mohawk is another of their tubs, which has a 3-inch rim. The manufacture of these tubs is facilitated by the use of natural gas under the enameling ovens, a well having recently been sunk on the grounds of the company. Natural gas is also used under their power boilers in their brass foundry and copper shop, coal being used only in the cupola for melting cast iron. The company have just issued a 16-page catalogue specially devoted to the white enameled cast iron bathtubs, in which the goods are shown with plain overflow and waste and with the supply fixtures attached. The catalogue also illustrates their solid copper, steel case, galvanized and painted steel and hospital baths. One page is devoted to a list of sizes, styles and prices of copper lined wood tubs.



New Enameled Baths.

The Plumber Turned Rah-Rah.

The boss plumber, says the Kansas City *Star*, had a man who was so tough that he was almost useless. There was only one place in which he could be allowed to work, and that was in an uninhabited house. If this plumber was sent to a house in which a family lived, a telephone message would be sent to his employer to remove him. He was an artless user of robust profanity. He expectorated on the wood work and he had an unpleasant habit of chucking servants, pretty or otherwise, under their chins. This made him unpopular in well regulated households. But he was a good workman and the boss plumber was regretfully compelled to give him "his time," which means in labor circles paying him off and discharging him.

One day the boss plumber sat at his desk, when there appeared to him a brawny youth, with a wadded sweater about his neck and a good peck of hair on his head. It was the tough plumber.

"Dis is me," said the tough plumber. "I ain't done a tap in t'ree monts. You ain't so warm, an' swipin' a joint ain't de only t'ing I can do. I'm swipin' college boys now. I'm a rah-rah meself, so to speak."

"I don't quite catch your meaning," said the boss plumber.

"W'y, I'm a gladiator of de pigskin sp'ere, as de sportin' editors say. I'm a foot ball player." And the tough plumber looked fierce. "I'm wot dey calls a center rush, an' when I get a goin' an' buck de line, sa-a-y, dere ain't no set of feet ball playin' stoodents of Greek that can stand up fer a minute. Oh, I swipe deir joints good an' plenty."

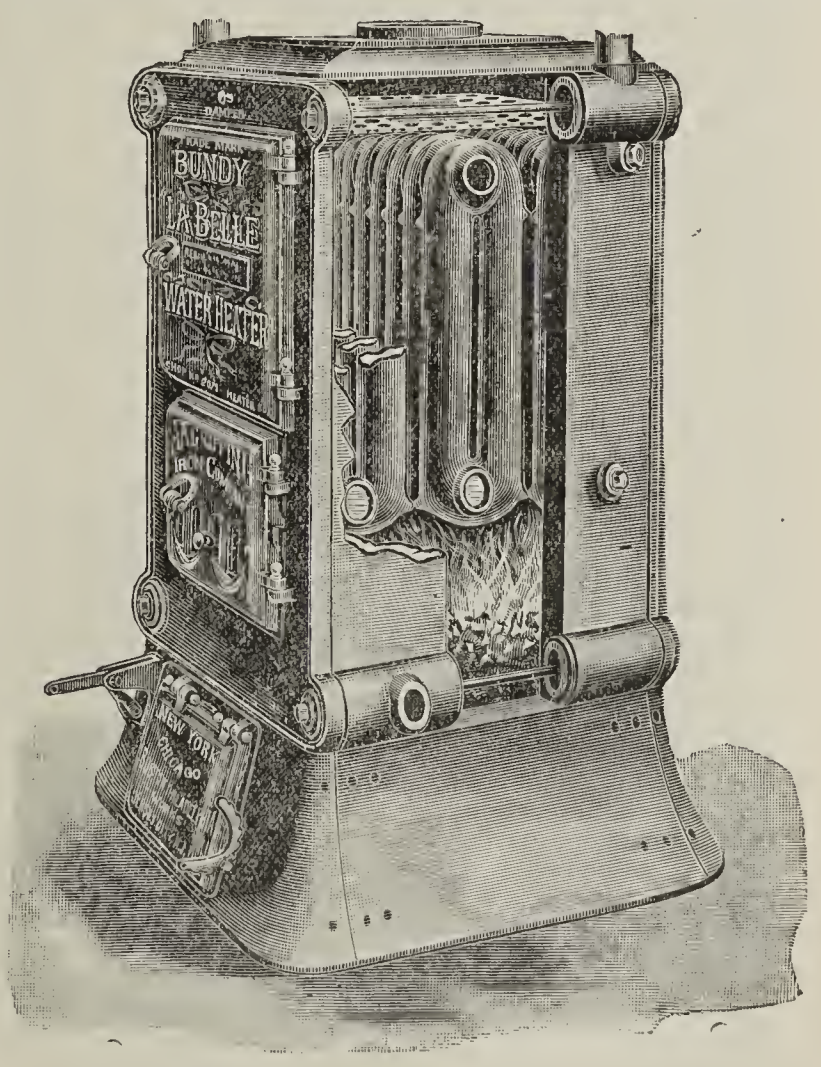
"Well, I am glad you are at work," said the boss plumber in a conciliatory tone. "How do you like it?"

"How do I like it?" said the tough plumber. "Say, it's great. Softest snap I ever had. It's one continuous scrap from start to finish. I don't pertend to know much about de game except de signals, 'A B x 240' an' t'ings like dat. All I got to do is to down de udder fellers, and dey gits downed. When dey gits troo wid me de ground's soft wid me beatin' 'em into it. Well, so long. But you don't git me to do no more plumbin' when I can git $10 a game an' four pounds of beef a day at de trainin' table fer bein' a rah-rah at a college wid a chancst fer a scrap an' no p'liceman to interfere. I'm goin' to get me pardner, Reddy McGuire, de iceman, a job playin' foot ball on de team next year. Say, won't we be holy terrors on de gridiron?"

The tough plumber swelled his muscles up until his sweater creaked, and walked off to the college to be a real rah-rah boy.

The Bundy La Belle Hot Water Heater.

In the accompanying illustration we show the Bundy La Belle hot water heater, which is made in five different sizes, ranging in capacity from 450 to 1125 square feet of radiation, all with a uniform hight of 60 inches, which makes it well adapted for use in cellars of low hight. It is made by the A. A. Griffing Iron Company, Jersey City, with offices at 66 Centre street, New York; 178 Fort Hill square, Boston, and 702 Arch street, Philadelphia. The boiler is of sectional construction, with all joints made with lathe turned smooth nipples, iron to iron. The grate



The Bundy La Belle Hot Water Heater.

rocks and dumps, and is of the Bundy non-warping type, adapted for burning hard or soft coal, coke, wood, gas or bagasse. The flame and hot gases heat by direct impingement against the sections as they ascend vertically to a perforated crown plate, which also has one large hole with damper to control the draft. The makers claim a maximum of direct fire surface for the La Belle heater; in fact, show that it is practically all direct fire touched surface. The side sections hold sufficient water to insure uniform results, while all openings are large to permit of the water of different temperatures passing up and down or crosswise without frictional conflict. A large front clean out door facilitates intelligent use of the brush for cleaning. The company will be glad to send their literature on heating apparatus to those who apply for it.

Inspection of Plumbing.

Thomas P. Watts, well known as a prominent plumber of Louisville, Ky., but who has retired from the plumbing business, writes a letter to the *Courier-Journal* in favor of city legislation to provide a plumbing inspector, from which we have taken the following extracts:

Louisville is the only city of more than 100,000 inhabitants in the United States that has no official of this kind. I have worked as an apprentice, journeyman and master plumber for 20 years, and being endowed with a reasonable amount of intelligence, I have given this matter some study. There should certainly be a plumbing inspector in Louisville, and in fact wherever water fixtures are introduced into a house for convenience.

Your physicians tell you that 5000 people die in the cities every year from preventable diseases. That is not many, you say, out of 70,000,000, but suppose one of them happened to be your wife? Then it would be different. There is not a reputable physician in the city who will not make inquiry into the plumbing apparatus when he finds a patient with typhoid, diphtheria and various other troubles; and this reminds me of a case where I was called in by a physician. A child was sick with typhoid fever, and the physician and father asked me to make an examination, which I did, in the presence of both, and found apparently new work extremely defective. The father gave me an order to make the alterations as speedily as possible, but he never came into the bathroom again, as he took sick with typhoid, and died almost before we were through with the changes. The defective work was not the fault of the father, because he was the owner, and able to pay for what he had ordered. It was the result of confiding in some one who did not have the intelligence to do his work in a sanitary way or was a rascal and wanted to cheat. Now, generally the well to do people pay a good price, get a plumber of reputation, and get correspondingly good work. But when work is let out to the lowest bidder, then generally the tenant will have to suffer the consequences. If the public could only look at the matter right, there would be no trouble. For instance, you go to buy a pair of shoes. You have prices ranging from $1.50 to $5; do you take the $1.50 shoes as the best? Not much! If you do take the $1.50 shoes, you only get $1.50 worth of wear; where, if you had bought the $5 shoe, you would get from $6 to $7.50 worth of wear. So it is with plumbing. Why, I know of numberless houses that it would be far better if the landlord would take out all the plumbing and let the tenants return to the primitive methods, so far as the health of the inhabitants is concerned. There are some men in the plumbing business (not many) who are conscientious and have sufficient knowledge to make a bathroom fit for a sleeping apartment in an emergency; but, usually these plumbers are either hampered by price (or an architect, who knows how to allot a space for various fixtures and could not describe a single one or give a reason why this or that fixture is better), or conditions over which they have no control. The city is flooded with a lot of incompetents, who lost their jobs because of incompetence, or other acts that a reputable man could not tolerate, but now, behold! they have blossomed into master plumbers, with a lot of landlords who want the water to run only, as they cannot stand the expense to make necessary repairs. Yes, sir; every house should be in a sanitary condition, so far as plumbing is concerned, or have no plumbing at all. The inspector should be a practical plumber, who could stand an examination from a committee of plumbers and also a few questions from physicians as to the scentific part of the business; and at the same time there should be a plumbing law governing the class of fixtures, pipe, traps, &c., as there are many fixtures in use to-day that, if an owner had explained to him the defects, he would remove them at once. It is not essential that the fixtures be expensive, as there are many of the cheaper fixtures which, from a sanitary standpoint, are much better than the more costly. You will find some of the master plumbers who will be opposed to this measure because of selfish motives, or fear of standing an examination, but I assure you that it will come. If this law is passed, it should embody in it that every master plumber and journeyman should stand an examination and qualify themselves before being allowed to do any service or dally with the health of the city. The examination fees would pay the expense of the committees. The capable physician cures disease. The capable plumber prevents disease. The physician has his diploma. Why not the plumber? I have spoken in this line because I think Louisville needs such an officer. I am not in business and never expect to be again in this city. I don't want the job of inspector, or anything pertaining to it, nor do I know who I could recommend for the position; but it should be given to the one who applied and stood the highest examination before the committee. The office need not cost the city $1 per year, as the certificates and licenses would cover all of the expense. If the city should enact such a law or ordinance, it would stand about this way: 75 per cent. benefit to the community and 25 per cent. benefit to the reputable master plumbers.

R. M. Wilson Mfg. Company,

Rome, N. Y., have been incorporated, with a capital stock of $50,000, to succeed R. M. Wilson. The new company will continue to make plumbers' supplies, bathtubs and enameled goods, and with increased capital and better facilities are looking forward to doing a much larger business than ever before, the prospects for the coming year being exceptionally bright. The directors of the new concern are Robert M. Wilson, Amanda C. Wilson, Jonathan S. Haselton, Willey L. Kingsley and William R. Huntington.

NOTES.

The Kenney Sanitary Mfg. Company, 47 Dey street, New York City, makers of the Kenney system of Water Column Water Closets, which have been described in *The Metal Worker*, and with which our readers are generally familiar, have been succeeded by the Kenney Company, a corporation organized under the laws of the State of New Jersey, and the business has been removed to 72 Trinity place, New York City, near the Rector street station of the elevated railroad. The new company propose to enlarge the business, pushing it to its fullest limit. They have large contracts now on hand and the prospects for further business are very promising. The new quarters of the Kenney Company will be handsomely decorated and convenient in every way.

Mark Dean has resigned his position with the Herendeen Mfg. Company to engage in a new venture in the heating specialty line in Boston, Mass.

W. B. Meyer has transferred his interest in the plumbing business of H. C. John & Co., Fort Wayne, Ind., to his son, Henry F. Meyer.

The St. Louis Radiator Mfg. Company, St. Louis, Mo., have filed affidavit of an increase of their capital stock from $50,000 to $100,000.

H. M. Page has opened a plumbing shop on Larimer street, Cheyenne, Wyo.

Henry Kidder has opened a plumbing shop in Winooski, Vt.

Clements & Aumoch are a new firm in the plumbing, gas fitting, tinsmithing, stove and heating business, at 7 Seaview avenue, East Long Branch, N. J. They have the contract now for the work on five new houses.

Langford Rogers and James Conners have opened a new plumbing shop at Olean, N. Y.

Frank H. Chishelm has opened a plumbing shop at Watseka, Ill.

C. M. Post has opened a plumbing shop on North Gray street, Champaign, Ill.

Kirk & Staton are preparing to engage in the manufacture of Heating Apparatus at Bellaire, Ohio.

I. G. James, 48 Centre street, the New York manager of the Gurney Heater Mfg. Company, Boston, Mass., has engaged W. H. Smith, who is well known to the heating trade, to assist in handling their growing trade in Bright Idea, Doric and the Gurney line of Heating Boilers.

A letter from Stevens & Cummings, Ligonier, Pa., informs us that they have purchased the plumbing and heating fixtures of A. P. Roberts of that place, and that they are now the only master plumbers in the city. They report that they met with good success last year.

The American Pin Company, Waterbury, Conn., well known as manufacturers of Pins, advise us that they possess complete facilities for the manufacture of articles in tinned or wrought brass and steel. They also make a specialty of Brass and Bronze Castings and furnish esti-

mates on articles in part or complete. Besides the above named articles, they make a line of Plumbers' Supplies and Upholsterers' Hardware.

The firm of Ingleson & Co. have succeeded R. M. Starbuck in the plumbing and gas fitting business at 1106 Main street, Worcester, Mass. The firm also do tin, copper and sheet iron work, tin roofing, hot air heating, &c. As they have just begun business they advise us that they would be glad to receive catalogues and price-lists from manufacturers and jobbers.

George W. Getchell and Joseph E. Chamberlain have formed a partnership in the plumbing business at Bangor, Maine.

Frank Robertson has opened a plumbing shop in Menominee, Mich.

Byron Wallrath has opened a plumbing shop at Tottenville, Staten Island, N. Y. A water supply and a sewerage system are being provided in that place.

Peter A. McQuillan succeeds D. J. Harrington as plumbing inspector of St. Paul, Minn.

A bill has been introduced into the Legislature of New York to amend the Plumbers' Registration act of 1892, exempting cities of the third class from the provisions requiring that all inspectors shall be practical plumbers.

Edward E. McIntire has been elected inspector of plumbing at Portsmouth, N. H.

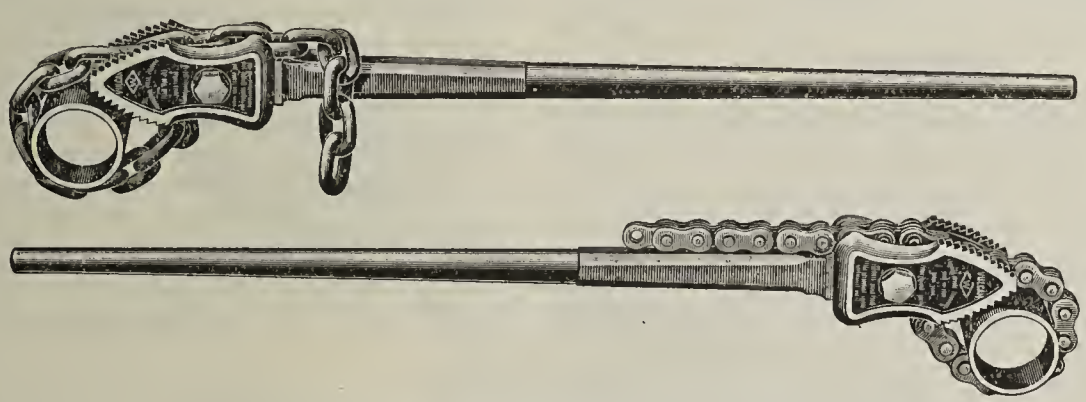
L. E. Millea has sold his plumbing business at Salem, Mass., to his brother, Wiliam H. Millea.

Howard Wortman, Baldwins, L. I., is now engaged in setting up several of the McGrane Acetylene Gas Apparatus made by the McGrane Acetylene Gas Company, 187 Broadway, New York, for customers in that place, there being no gas supply in the town, and those which he has already set up have given satisfactory results to the customers. Mr. Wortman has during the season set 21 Wind Mills made by the Aermotor Company of Park place and West Broadway, New York City. These Wind Mills are used in connection with tanks for supplying water for the pumping systems which he has installed in the buildings of his customers.

The Board of Aldermen of Chicago has passed an ordinance creating a Board of Examining Plumbers with three members and a secretary at a salary of $1500 a year each. The positions were filled under the old ordinance, passed December 13, 1897. The change was in the clause which made the first examination final instead of yearly. The examination fees are $5 for master plumbers and $1 for journeymen.

Drop Forged Steel Chain Pipe Wrench.

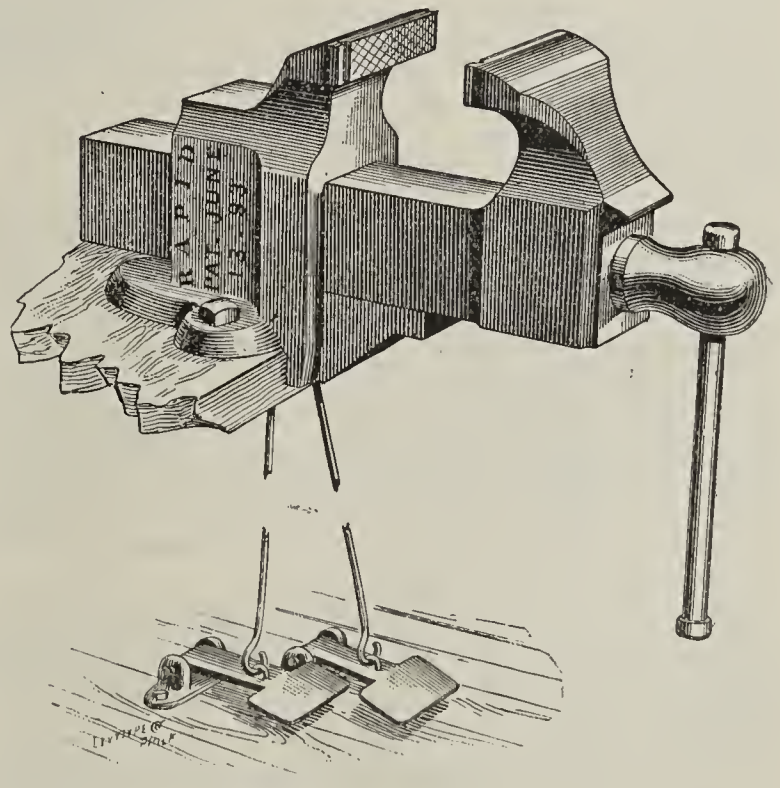
J. H. Williams & Co., 9-13 Richards street, Brooklyn, N. Y., are just putting on the market the Vulcan patent drop forged steel chain pipe wrench shown in the accompanying cuts. They are made with cable and with flat link chain, and are designed for gripping, turning or holding pipe, bolts, bars, shafts, &c. The wrench is made in seven sizes to take articles from ⅛ inch to 12 inches. They are made wholly from wrought steel, to be strong and durable. The drop forged jaws are stated to be of saw temper, so that the teeth can be sharpened by filing only. The pressure of the teeth, it is explained, is in a line tangent to the circumference of the pipe, which, combined with the encircling grip of the chain, prevents crushing. The wrench is sold with either cable or flat link chain, and is the only wrench, it is claimed, adapted for either. To change the chain one cap screw is unscrewed—neither jaw is removed—the internal pin on which the chain swings is slipped out, thus releasing the chain, when the new chain may be inserted. It is remarked that the cable chains are of finest quality, only the D. B. G. special crane chain being used. This chain is hand formed and tested link by link, and bears the trade-mark D. B. G. It is further remarked that the flat link chains are hand made from steel prepared expressly for the company and carefully tested in an Olsen testing machine. The point is made that the chain swings from the center and can be used on either side of the jaws, reducing wear of the teeth to a minimum. The wrench, it is shown, is equally efficient on fittings and straight pipe, in corners, against walls, between floors, in ditches, or for overhead work. Each fits a range of sizes equal to six pairs of common tongs, and will, it is claimed, outwear several pairs of any kind. The tools are interchangeable in all parts, repairs can always be had, and the wrenches are fully guaranteed. Among other advantages are that the jaws are duplicate, reversible and serrated on both sides; that the assistance of a blacksmith is not necessary when the teeth become dull; that the tool is not disabled if the teeth on one side break, as it can be instantly used on the other side, and that repairs can be secured without sending the wrench away. It is stated that the price-list has been revised, while a greater discount will be offered than for any other similar tool. The makers state that the wrench is the fruit of 12 years' experience in making chain pipe wrenches, and that they claim for it superiority in every respect.



Drop Forged Steel Chain Pipe Wrench.

The Ayars Rapid Vise.

The accompanying illustration shows the vise which the Ayars Machine Company, Salem, N. J., are putting on the market. In operation the vise may be instantly changed to take work of any size from 0 to 8 inches without turning the handle, by simply pressing the front treadle shown in the cut. Pressure on the back treadle holds the jaws fast until the hands are at liberty to tighten with the handle. The back lever is only used when there are two or more articles to be held at one time and both hands are required on the work. The vise has an ordinary screw and when required may be used in the same manner as any other vise. The rapid closing action is obtained by means of a nut actuated by a spring, both contained in the housing. A pressure of the front lever causes the spring to throw the nut clear of the screw, and a pressure of the rear lever, by pulling the nut forward,



The Ayars Rapid Vise.

holds the work securely until tightening can be effected by the handle. There is a V groove at one end of the jaws to hold round iron, pipe, screws, bolts, &c., perfectly rigid. The vise is described as being well made and having tempered steel jaws and steel screw and nut. It is made in two sizes, with jaws 5 and 5½ inches wide, and weighing 60 and 90 pounds respectively.

TIN PLATES.

Additions to Tin Plate Brand List.

Dickerson, Van Dusen & Co., 29 Cliff street, New York, advise us that they are the owners of the following brands of American tin and terne plates, which should be added to our list of Dealers' Special Brands, printed in *The Metal Worker* of January 1, 1898:

BRIGHT CHARCOAL PLATES.

Daisy.	Falcon.	Major.
Dale.	Ford.	Moro.
Douglas.	Madrid.	Poplar.

BRIGHT COKE PLATES.

Cornell.	Monarch.	Derby.
Watson.	Hanover.	

TERNE PLATES.

Aline.	Fulton.
Astoria.	Harold.
Axminster Old Style.	Stella Old Style.
Clinton.	Westminster Old Style.
Dickerson Old Style.	Yankee.

SCRAP.

The committee of Tin Plate makers who are engaged in drawing up plans for the proposed consolidation of tin plate interests are still diligently at work. The matter is understood to have made some important steps forward during the past week, but all the proceedings connected with the project are conducted with the utmost secrecy, and but little news has leaked out as to what has been actually accomplished. A meeting was held on Wednesday, at which some of the leading New York jobbing houses were represented. This has served to revive the rumor that an effort is being made by the houses in question to arrange for handling the entire output of American Tin Plate. Much interest in the whole matter is felt by the trade at large, and developments are somewhat anxiously awaited.

The Atlanta Steel & Tin Plate Company, Atlanta, Ind., have completed the addition of three new mills to their plant, thus doubling its capacity and making it a six-mill works.

Two of the mills in the new plant of the National Tin Plate Company, at Monessen, Pa., have been completed and put in operation. The balance of the mills will be started into work as they are finished, until the whole plant is in operation. The company will only turn out Black Plate for the present, as the Tin house will not be completed for some time.

At the recent quarterly Tin Plate meeting at Birmingham, England, a conference of Welsh Tin Plate manufacturers was held with Thomas Worthington, a special commissioner of the British Board of Trade, who has been appointed to visit South America to inquire into the conditions and prospects of trade in that country, and a committee was appointed to furnish the commissioner with facts and figures, so that his visit to South America might be made of special value to the Tin Plate trade of Wales. Particular efforts are to be made to enlarge the trade with the Argentine Republic, where the prospect for the establishment of canning factories on a large scale is regarded as encouraging.

The Joint Traffic Association has announced the freight on Sheet Bars and Tin Plate Bars from the Valleys to Cumberland, Md., to be $1.55 per gross ton, and the freight on wooden Tin Plate boxes from Hopkins, Pa., to Pittsburgh at 8 cents per 100 pounds.

It is currently reported that the capitalization of the proposed Tin Plate combine has been decided at $25,000,000.

The affairs of the Earlswood Tin Plate Company of Briton Ferry, South Wales, are announced to have been placed in the hands of a liquidator, with the view of winding up the concern.

In an interview printed in *The Iron Age*, Edward Le Bas, of the London firm of Edward Le Bas & Co., who represent in England the Illinois Steel Company, the National Tube Works Company and the Consolidated Steel & Iron Company, who has just returned home after a visit to this country, said that there is a good chance for American Tin Plate Bars in England. Mr. Le Bas states that there is always a market there for this class of material, and the quality of the American Bars sent over has been such that they are very much liked.

Thomas R. Cook, Jr., of Riter Bros. & Co., Philadelphia, was one of the recent visitors at the office of *The Metal Worker*, and had a good word to say for their Bright and Terne Plates for tinners.

A laurel crowned portrait of Lincoln, accompanied by a United States shield and pictures of a log cabin and the White House, is the decorative feature of the blotter calendar issued this month by Follansbee Brothers Company, Pittsburgh, Pa., in the interests of their Tin Plate and Sheet Iron.

McClure & Co., 211, 213 and 215 Second avenue, Pittsburgh, Pa., and 115 North Seventh street, Philadephia, are sending out to the trade a leather bound memorandum book which is sure to be appreciated by those receiving it. At the top of each page attention is called to McClure's Redipped Roofing Tin, concerning which it is stated that it is made from the best Siemens-Martin steel and coated by the pure palm oil process. Further reference is made to the weight and evenness of the coating, and every sheet is stamped and resquared. Another announcement on the inside cover page is to the effect that McClure's Redipped Roofing Tin was used in the construction of the following buildings in Pittsburgh: Consolidated Traction Company, in which 3000 squares were used; Department Public Safety, Zoo, Chautauqua Lake Ice Company, Weaver, Costello & Co., Bair & Gazzam Mfg. Company, Liberty National Bank and Western Pennsylvania State Institution for the Feeble Minded, at Polk, Pa., on which 1000 squares were used.

Production of Precious Metals.

The annual report issued by Wells, Fargo & Co. of precious metals produced in the States and Territories west of the Missouri River (including British Columbia) during 1897 shows in the aggregate, gold, $69,830,597 ; silver, $37,184,034 ; copper, $36,645,694 ; lead, $9,775,144 ; giving a total value of $153,435,469. The following table of output is based on an estimated commercial value of silver at 60 cents per ounce, copper 11 cents per pound and lead $3 38 per 100 pounds : .

States.	Gold.	Silver.	Ores and base bull'n.	Total.
California	$17,621,959	$12,948	$1,195,917	$18,830,824
Nevada	2,632,340	451,494	234,052	3,317,845
Oregon	2,404,797	45,000	11,900	2,461,697
Washington	471,949	70,000	26,560	568,109
Alaska	3,571,000	.....	52,000	3,623,000
Idaho	2,725,000	4,555,600	2,741,000	10,021,600
Montana	4,450,000	9,452,000	26,325,500	40,277,500
Utah	1,663,254	813,748	6,770,440	9,247,442
Colorado	18,326,554	12,869,783	3,780,492	34,976,829
New Mexico	553,678	153,348	193,000	880,026
Arizona	3,392,991	143,693	8,698,821	12,235,505
Dakota	5,829,575	220,000	36,000	6,085,595
Texas	5,000	309,717	1,800	316,517
Wyoming	27,500	31,000	2,000	61,000
British Columbia and N. W. Territory	6,175,000	3,150,000	1,257,000	10,582,000
Totals	$69,830,597	$37,278,290	$51,326,582	$153,435,469

The Commercial Club of Mobile, Ala., is working hard for the establishment of a shipyard at that port. It is claimed that all the raw materials for shipbuilding, such as iron and steel, wood and coal, can be furnished at Mobile at as cheap a cost as at any other port of the country, and favorable sites for a yard are plentiful in the vicinity of the city.

Five carloads of 2½-inch chains for heavy vessels and other uses were shipped from Lebanon, Pa., last week *en route* to the Hawaiian Islands. The chains were manufactured at the chain works of the West End Rolling Mills. The chain works are running on extra time. Several Government contracts are being filled as speedily as possible.

The New York City office of the American Luxfer Prism Company has been removed from 24 Beekman street to 160 Fifth avenue.

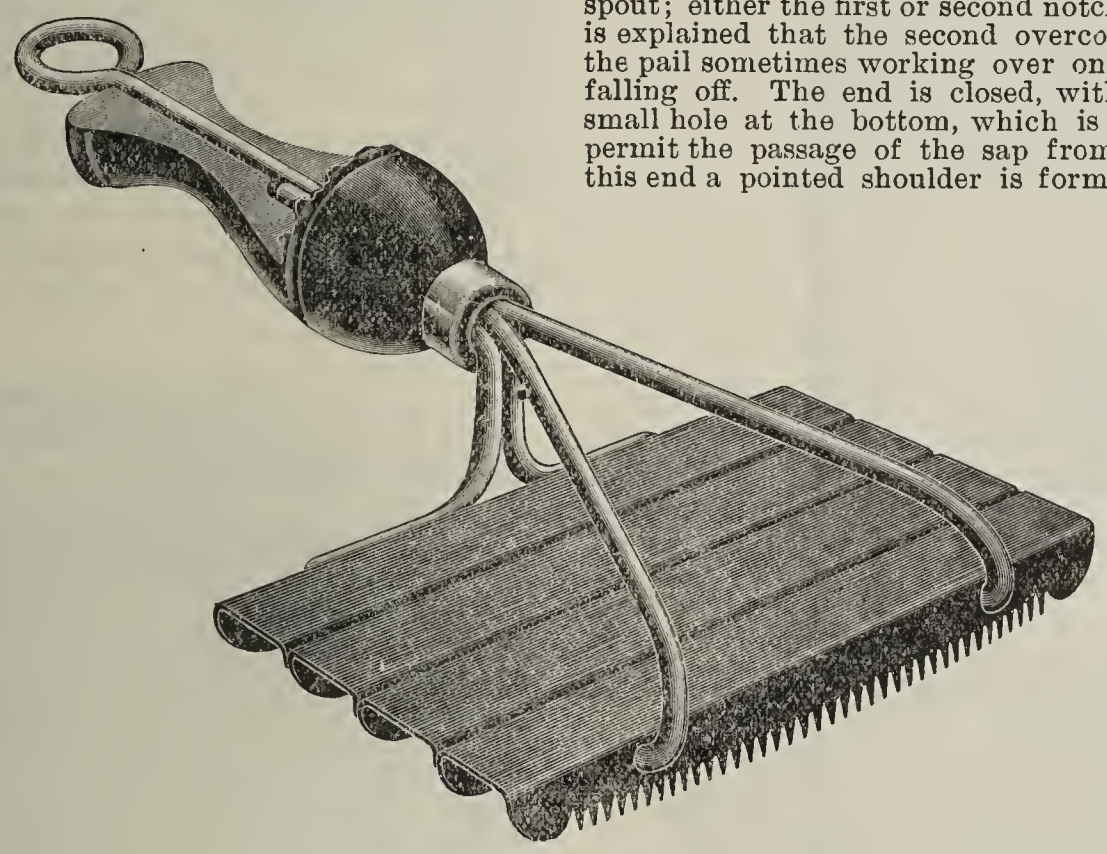
THE RETAIL STORE.

Pearl-Agate Ware.

In the revised catalogue and price-list of enameled ware just issued by the Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, a new kind of enameled ware, called pearl-agate, is listed. This ware is described as made of sheet steel, coated on the inside with an absolutely pure white porcelain, and on the outside with the enamel of bright mottled colors, presenting a tinted, wave like effect very handsome and attractive in appearance. The assortment of colors in which the ware is offered consists of violet, chocolate, salmon, russet and sage. The company are making a full line of utensils in pearl-agate ware for kitchen, house furnishing and other purposes.

Ringed Shank Curry Comb.

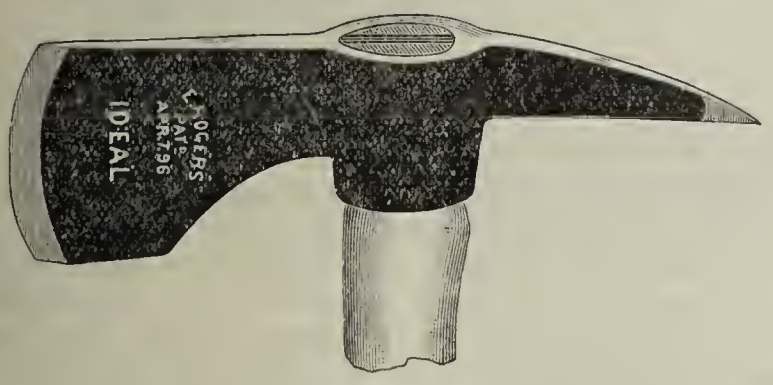
Edward S. Hotchkiss, Bridgeport, Conn., John H. Graham & Co., 113 Chambers street, New York, selling agents, is manufacturing the improved Lawrence pattern curry comb with ringed shank, here illustrated. The steel wire back of the frame is continued through the handle, and the ring formed afterward. The engraving illustrates a section of the handle cut away to show the construction. This method is said to strengthen the comb, while affording also a handy device for hanging the comb up. We are advised that henceforth all Lawrence pattern curry combs—now about 15 in number—will be made in this manner.



Lawrence Pattern Ringed Shank Curry Comb.

Ideal Ice Hatchet.

American Axe & Tool Company, 253 Broadway, New York, have put on the market an addition to their line of

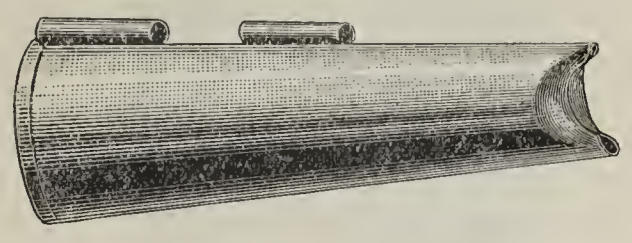


Ideal Ice Hatchet.

Rogers hatchets in the form of an ice hatchet, as here illustrated. It is made of crucible cast steel, in one piece, with adze eye, forge finish. The edges are polished and the axe is fitted with extra quality hammer pattern hickory handle. The axes are put up in dovetailed wood box.

X. L. Sap Spout.

The Youngstown Specialty Mfg. Company, Youngstown, Ohio, are putting on the market the sap spout



X. L. Sap Spout.

represented herewith. This spout is referred to as made double throughout and heavily retinned. The coils on top are made so that the sap bucket can be hung on the spout; either the first or second notch can be used, but it is explained that the second overcomes the difficulty of the pail sometimes working over one of the catches and falling off. The end is closed, with the exception of a small hole at the bottom, which is sufficiently large to permit the passage of the sap from the tree. Inclosing this end a pointed shoulder is formed at the bottom and top, which is referred to as increasing the strength of the spout and lessening the liability of its coming from the tree accidentally. These spouts are made in regular sizes for ⅜-inch tapping bit.

The Buckeye Dish Washer Company, Toledo, Ohio, issue a large circular in the interests of the Buckeye Dish Washer, which they manufacture. There is a graphic representation of the advantage of this apparatus, compared with the old style of washing dishes, while in the corner are detail views showing the construction of the device.

Dewey & Lawson are building a new store and office building in Royal Oak, Mich., and contemplate running the Hardware business in connection with the lumber line, carrying a stock of Shelf Hardware, Stoves and Tinware and Agricultural Implements. Mr. Dewey has been handling an assortment of Builders' Hardware for some time, but, desirous of extending his business, recently disposed of an interest to Mr. Lawson.

The Hardware stocks of J. O. Walrath and the W. J. Healey Hardware Company, Mitchell, S. Dak., have been consolidated, and the firm will hereafter be known as Walrath & Healey, dealers in Shelf and Heavy Hardware, Stoves, Tinware, Sporting Goods, &c. The stock carried is quite extensive. Improvements will be made in the store building in the shape of additions to give more room, and a new modern front.

The Babcock Hardware Company.

The accompanying illustrations of store arrangement relate to the wholesale and retail Hardware establishment of the Babcock Hardware Company, Binghamton, N. Y. The interior of the building, which consists of four floors and basement, was rearranged after being seriously damaged by fire with improved facilities for doing business and in modern style. Many of the ideas were obtained from the "The American Hardware Store," published by *The Iron Age*, supplemented by suggestions from traveling men and observations made while visiting modern Hardware stores in different parts of the country. Such features from these sources were adopted as were thought practical and would result in making the store a most convenient and attractive one.

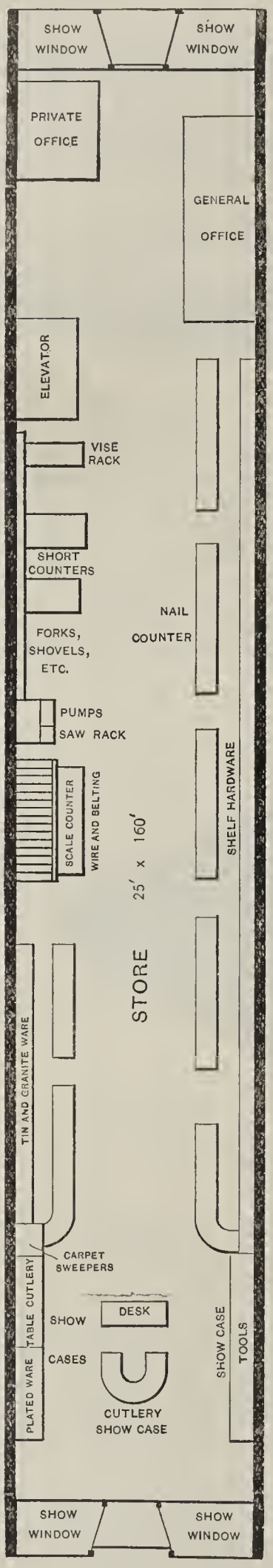


Fig. 1.—Floor Plan.

The store is 25 x 160 feet in size, and, as shown in Fig. 1, fronts on two streets, the front shown at the bottom of the cut, however, being the main one. This front is finished in quartered oak, with large plate glass windows. The recess between the windows forms a vesitbule, the floor of which is laid with tiling, in which the words "Babcock Hardware Company" appear.

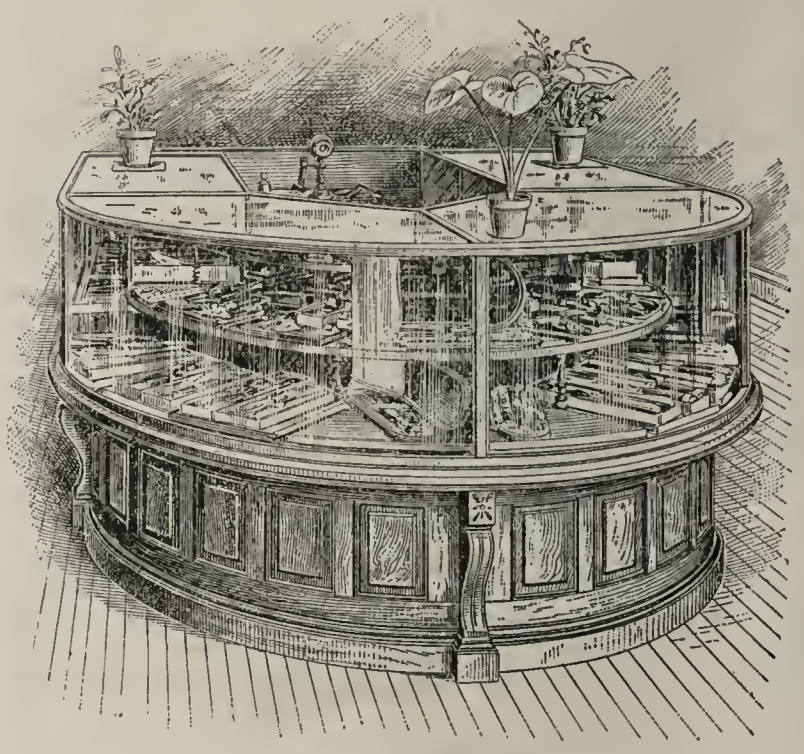


Fig. 2.—Horseshoe Shaped Case

The first floor is devoted to the retail part of the business, the goods displayed also serving as a sample room. This floor is furnished with electric lights, cash carrier system, traveling ladders and roll paper cutters, and with a ceiling of pressed steel of attractive design.

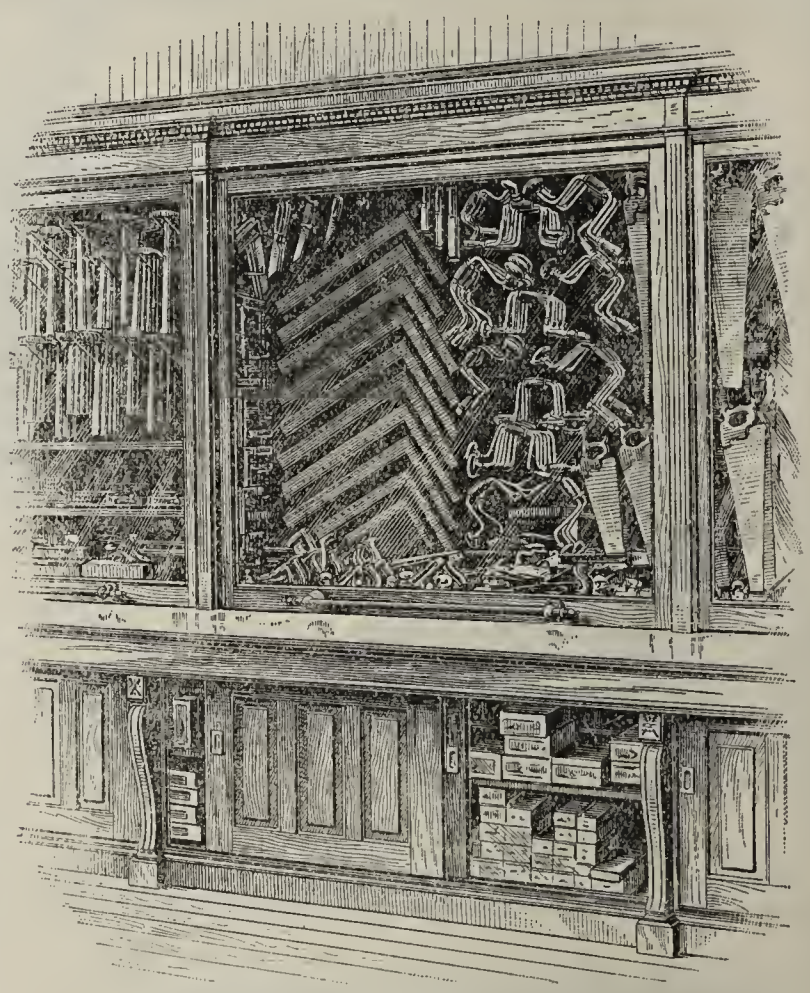


Fig. 3.—Tool Wall Case.

About 10 feet back from the entrance is a large horseshoe shaped case, Fig. 2, mounted on a low counter and containing Pocket Cutlery, Razors, Shears, Scissors, Revolvers, &c. Back of this is a desk, the space in the rear of which is used for seasonable goods, Refrigerators utilizing it in the summer. At the right of the Cutlery case and against the wall is an oak case, 20 feet long and 8 feet high, which is filled with Carpenters' Tools, Fig.

3. The case is built to be dust proof, with plate glass doors that raise, and is deep enough to contain a large stock and a varied assortment of Tools. The base upon

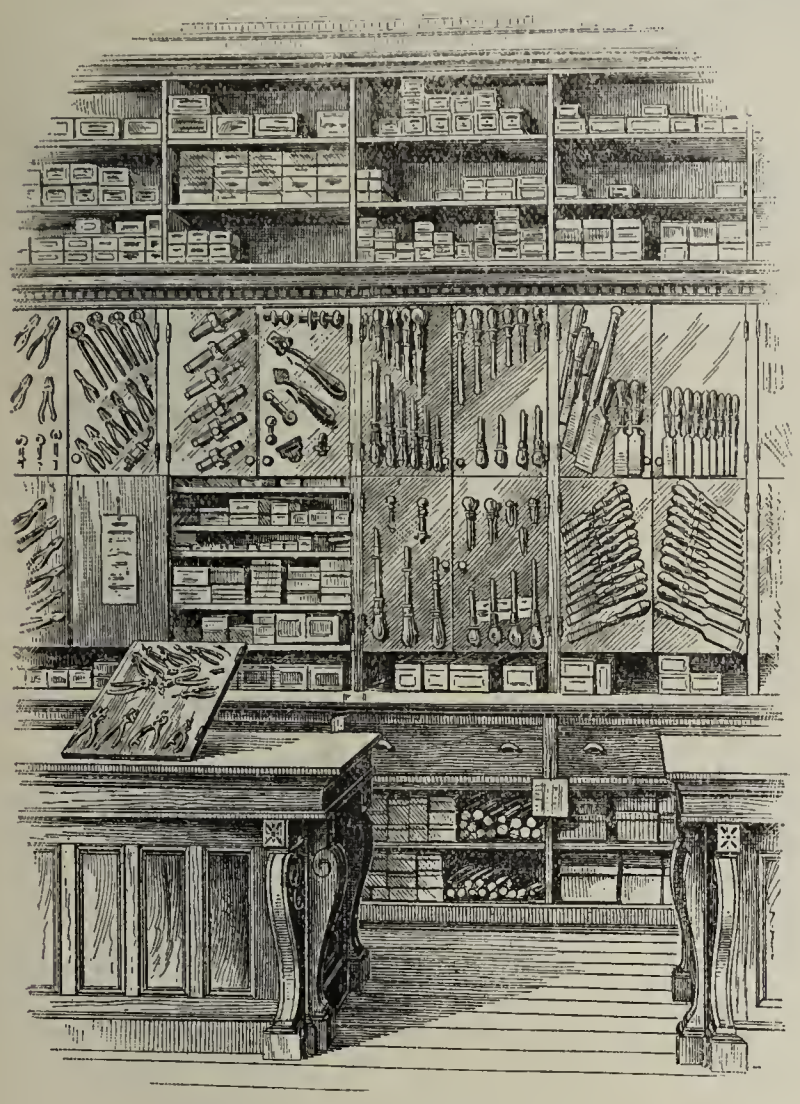


Fig. 4.—Shelving and Counters.

which the case rests has a wide ledge, under which are cupboards with sliding door for duplicate stock.

In the rear of this case is shelving arranged for Shelf



Fig. 5 —Step Ladders, Scales, Belting, &c.

Hardware, extending back 100 feet, with five counters in front, as shown in Fig. 4. On the uprights between the shelves doors of quartered oak are hung, which when closed protect the goods from dust, and upon which the samples of the goods contained in each section are fastened with holders, so that one sample may be removed and another easily substituted. The doors are hung on loose joint butts, so that they may be taken off and placed

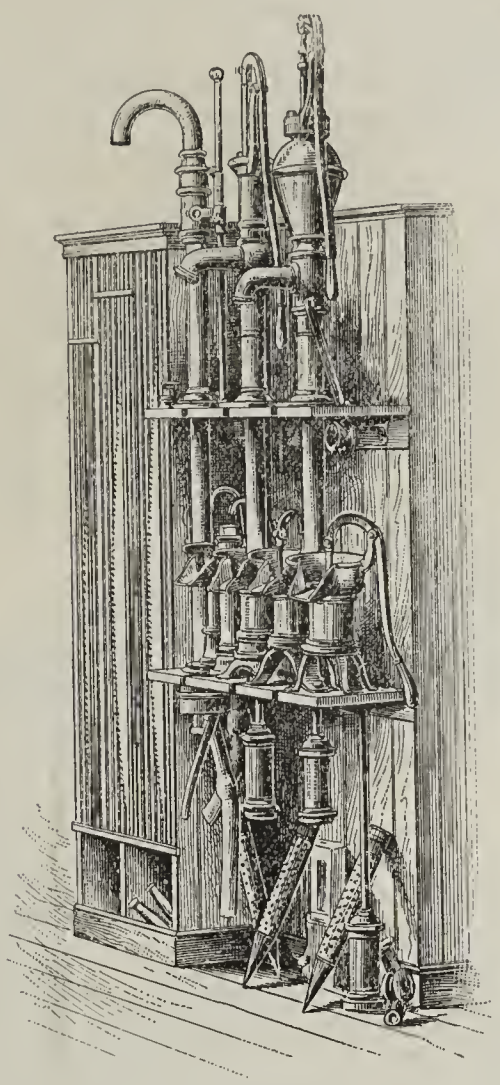


Fig. 6.—Cross Cut Saws and Pumps.

on the counter for the closer inspection of customers, as shown in Fig. 4. Price cards of the goods are hung on the inside of the doors, avoiding the necessity of marking prices on the original packages. The shelves throughout the store are adjustable, to accommodate boxes of differ-



Fig. 7.— Counters.

ent hights, or can be taken out entirely. Duplicate stock is kept in the shelves above, while underneath the ledge are drawers and bins for the accommodation of goods. At the rear of the shelving and counters is the general office.

At the left of the entrance is another wall case, the same size as the one in which Tools are kept. This is divided in two parts, one section being used for the display of Plated Hollow Ware and the other for Table Cutlery. The Cutlery case is shelved and between the shelves

fronts are placed inclining inwardly, upon which samples are fastened by clips. The shelves and clips are covered with black cloth, so as to show the Knives and Forks in bold relief. Behind the fronts is ample room for keeping the stock. In the rear of the case is a narrow open case for displaying Carpet Sweepers, which shows them in an attractive manner.

For 30 feet in the rear of this is shelving on which Tin and Granite Ware is kept, with a counter in front in two sections. Beyond this is the stairway leading to the second floor. On a strip fastened to the wall of the stairway are hung samples of Step Ladders, as in Fig. 5, the longer Ladders being near the bottom of the stairs. In front of the stairway is a counter upon which Scales are displayed. Under the counter are accommodations for heavy Galvanized Screen Cloth, and for Leather Belting of all sizes from 1½ to 14 inches in width. The Belting is

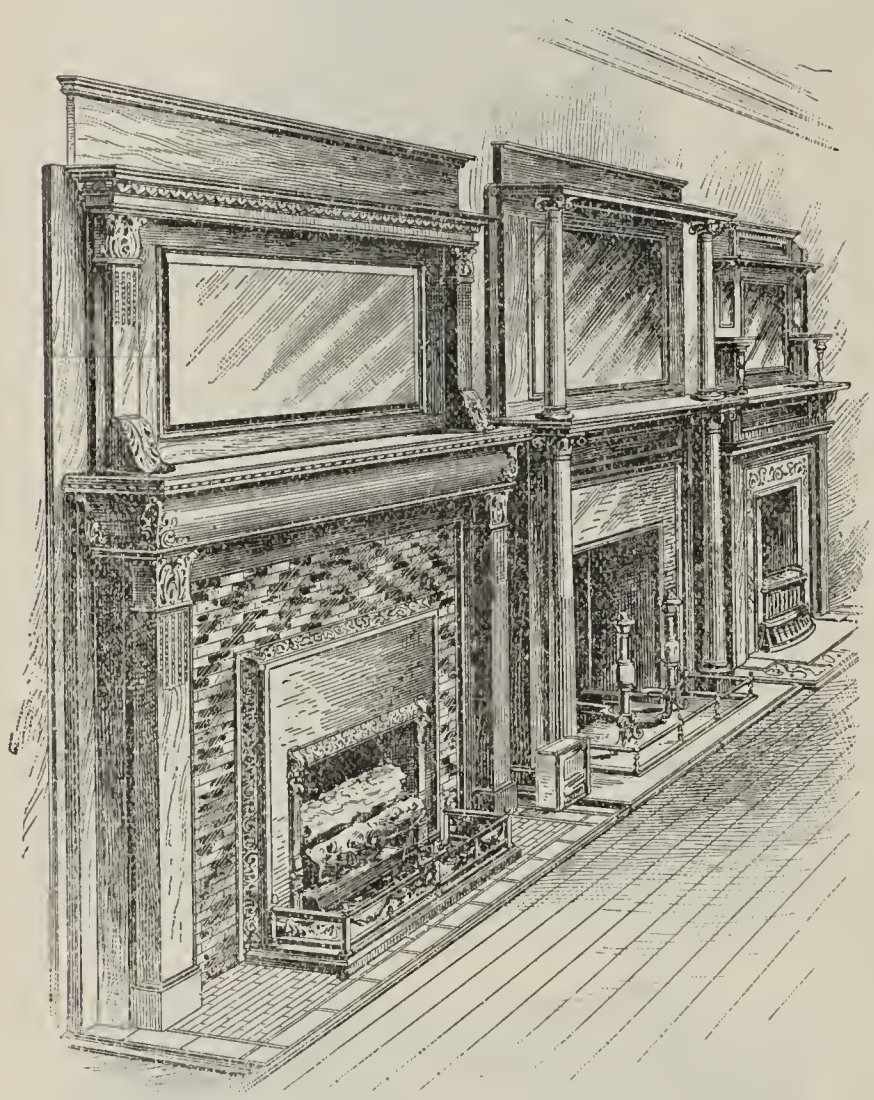


Fig 8.—Mantel and Gas Fixture Room.

hung on iron rods, so that it can be unrolled and cut off without lifting the roll.

Next to the stairway is a rack for Cross Cut Saws and a stand holding sample Pumps, Fig. 6. Between the Pumps and the elevator, hooks on the wall for a distance of 25 feet hold Forks, Hoes, Rakes, Shovels, Spades and other steel goods, besides Scale Beams and Pulley Blocks. The display of steel goods is partially shown in Fig. 7 back of the short counters. These counters, of which partial views are given, show the method of displaying Circular Saws and Axes at the ends. Poultry Netting, Vises, Corn Hooks, Snaths, &c., are laid on the top, while bins beneath contain Handles, Bolts and other heavy goods The elevator in the rear of the short counters is operated by an electric motor. Next to this are the private offices.

The rear portion of the second floor is used to display Mantels and Gas Fixtures, as in Fig. 8. The walls and ceiling are handsomely decorated, and from the latter is suspended a large line of Gas Fixtures, not shown in the cut. The firm state that they carry the most complete and best assorted stock of these goods in the city. Along both sides of the room, against the walls, are samples of Grates and Hardwood Mantels. There is also an attractive display of Tile work and wainscoting in almost endless variety.

The front half of this floor contains part of the wholesale stock, the remainder being on the fourth floor. The front half of the third floor is the shipping room, with facilities for prompt dispatch of goods. Heavy goods, Cordage, &c., are kept in the basement. Neatness and order are the rules of the store, and no goods or obstructions of any kind are allowed on the floor.

Excelsior Measuring Tape.

The Keuffel & Esser Company, 127 Fulton street, New York, are now manufacturing a line of Excelsior measuring tapes with patented improved centers, as here shown.



Fig. 1.—Excelsior Measuring Tape, Improved Center.

These American made tapes are referred to by the company as a superior article in accuracy, construction, material and workmanship. The patent center with flush folding handle, as seen in Fig. 2, has a large drum which winds the tape quickly and avoids the close coiling which injures the steel lines. A long swiveling handle, when closed, protrudes beyond the surface of the tape case, so that the crank can be thrown open by pressing on the projecting end of the handle. The larger center permits of using a longer crank, giving more leverage in

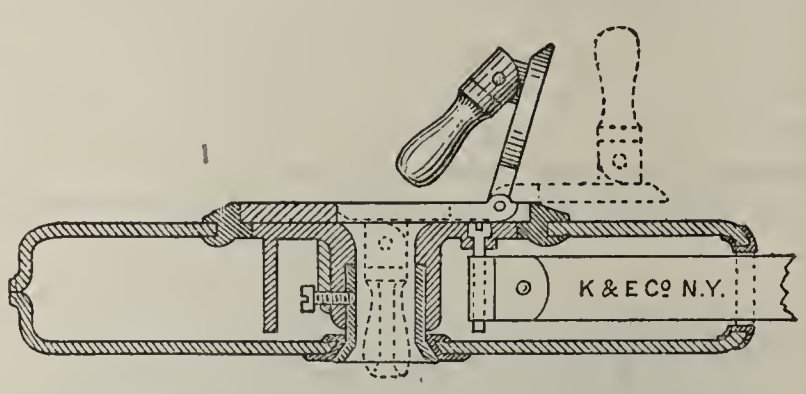
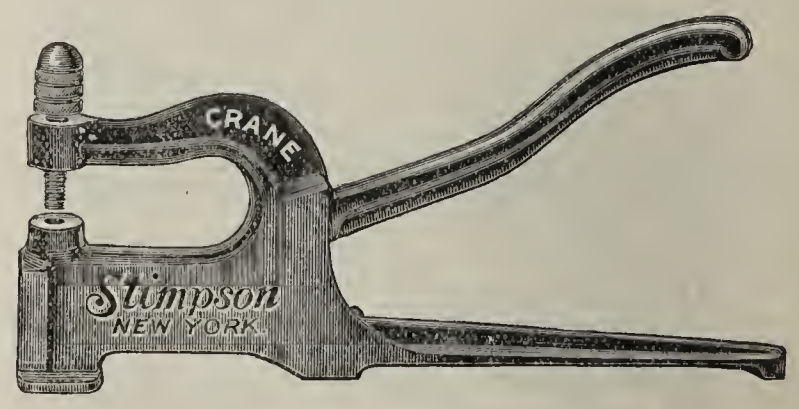


Fig 2.—Sectional View, Showing Interior of Case.

winding. Fig. 1 shows the article as put on the market. This style of tape is made in all their high grades both steel and metallic.

Crane Hand Riveting Machine.

E. B. Stimpson & Son, 31 Spruce street, New York, are manufacturing the Crane hand riveting machine here illustrated. It is designed for use in clinching tubular or



Crane Hand Riveting Tool.

bifurcated metal rivets in clothing, blankets, feed and mail bags, harness, belting, straps and numerous leather and other goods of similar character. In use the milled wrought screw at the top can be quickly adjusted to accommodate the necessary thickness up to ⅞ inch, the end of the screw being so shaped as to form the open end of the rivet. The rivet is dropped in the opening head downward, a down pressure of the lever forcing the rivet up through the material and clinching it against the end of the screw. Rivets with heads as large as 9-32 inch will enter the opening. The extreme length of the tool is 12¾ inches, it weighs 3¾ pounds, and can be retailed for $1.

Window Trimming Suggestions.

In Fig. 1 a show window is represented, trimmed with Brooms, Mops and Whisk Brushes. The center broom is fastened to a large screw hook at the top of the window by a string passed through the handle, after

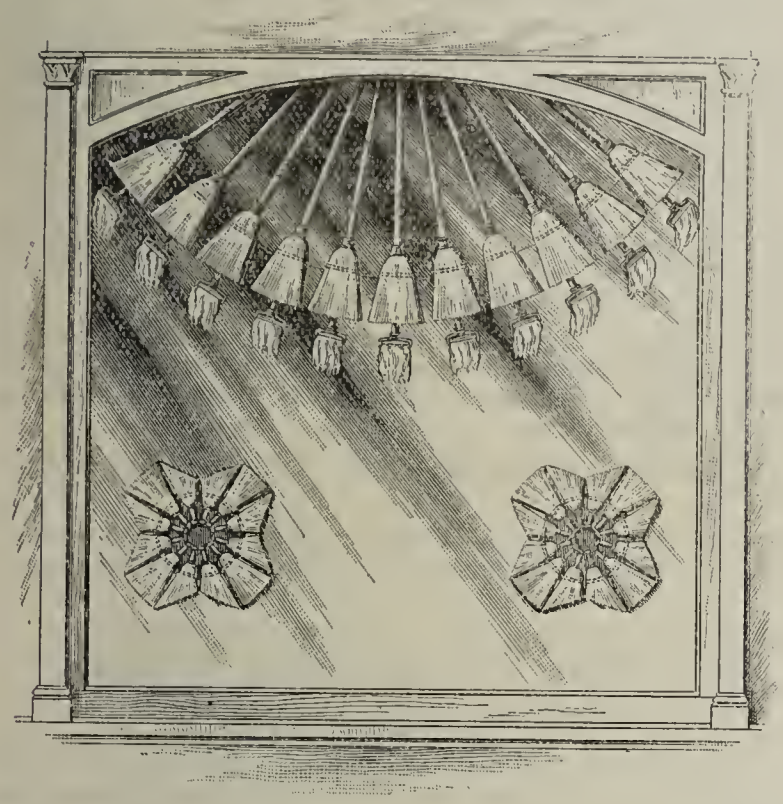


Fig 1.—*Window Trimmed with Brooms, Mops and Brushes.*

which the brooms are fastened to each side of the center one by tying each to its neighbor, working toward the ends. They will now hang in a bunch until separated. An artistic effect is produced by using a packing needle and twine, and sewing the twine through the body of the brooms, then fastening it at the top of each side of the window. The mop handles are fastened at the top to the broom handles and at the bottom to the body of each broom. This fills the upper portion of the window, making an attractive display, leaving the lower part necessarily bare and unfinished. The vacancy is filled with brush medallions hung by wire in the desired position. A detailed view is given of the medallions in Fig. 2, showing that they are made of angle and straight cut whisk brooms, fastened to a circular piece of wood 18 inches in diameter. The effect of this arrangement is pleasing and offers a scheme for relieving large show windows of their desolate, barnlike appearance. It can also be appropriately used in connection with displays of House Furnishing Goods.

Fig. 3 shows a pair of Wooden Shears, 3 feet in length, which could be cheaply made by a local carpenter. Scissors and Shears are attached to the wooden pair, which is suspended in the show window, on the line of vision. The rivet of the large pair is an incandescent electric lamp. For pushing a 25 cent line of Scissors and Shears this device is recommended as producing immediate results by A. Q. Casselberry, Pittsburgh, Pa., to whom we are indebted for these window trimming suggestions.

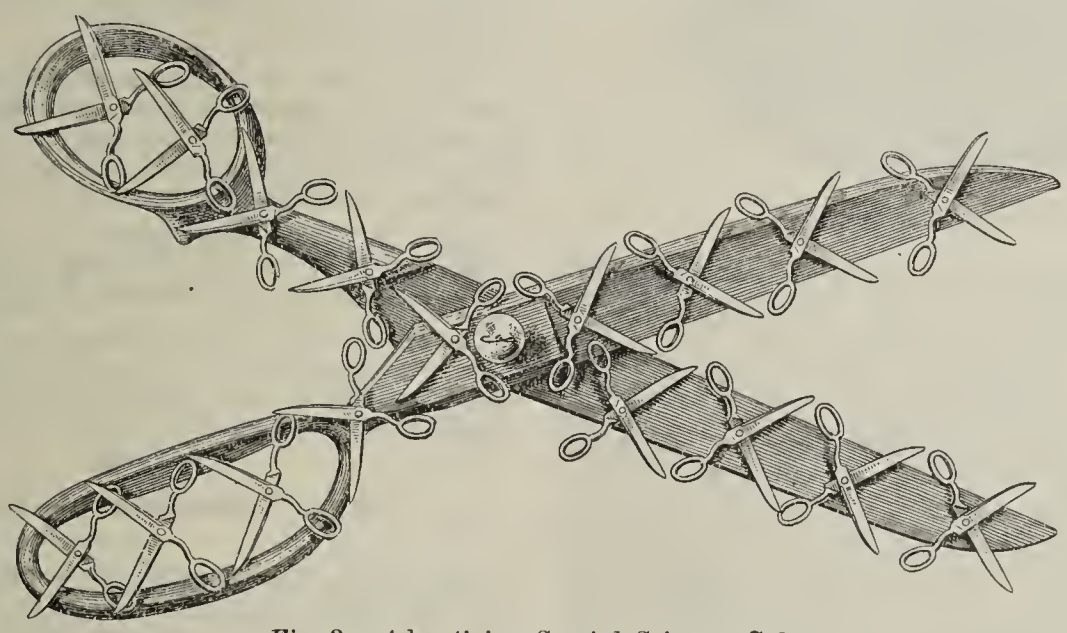


Fig. 3.—*Advertising Special Scissors Sale.*

Vent Nose Faucets.

A. B. Fisher, 385-387 Kent avenue, Brooklyn, N. Y., is introducing his improved vent nose dripless faucet for

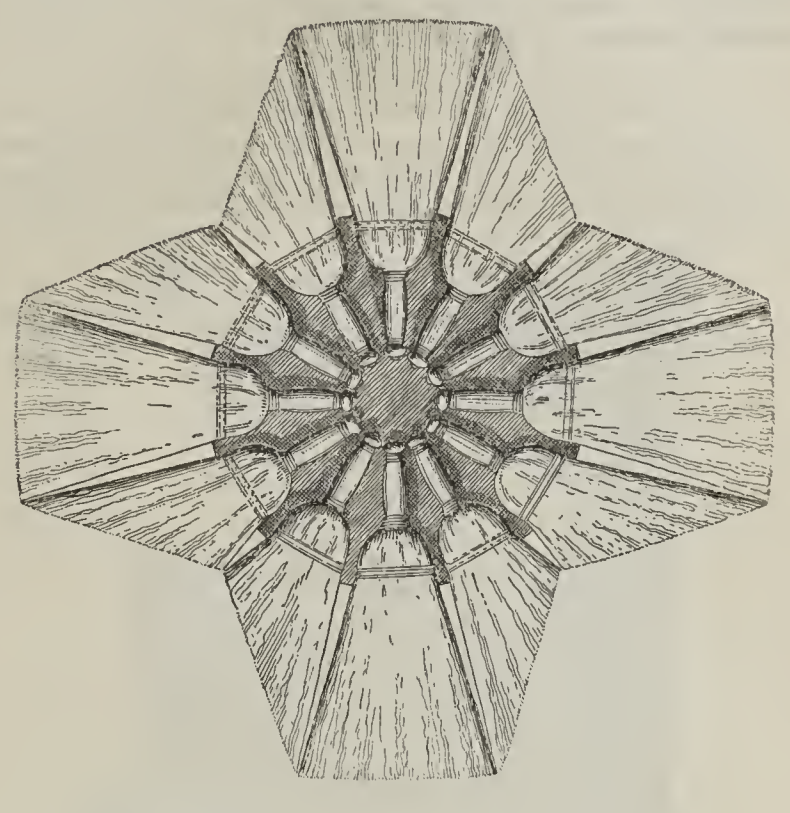


Fig. 2.—*Medallion of Whisk Brooms.*

coffee, tea, milk, beer, ale, &c., as shown in the accompanying engravings. Fig. 1 illustrates it as put on the market, the cut showing a removable cap at the front end so that a brush or other appliance can be introduced to clean out the interior, especially valuable in connection with milk. The faucets are also made without the clean out, as seen in Fig. 2, which is a sectional view illustrating the vent nose principle, by means of which all drip and waste is avoided, insuring both economy and tidiness. The principle on which the faucet is constructed is that a clear passageway is provided through the handle and out the front

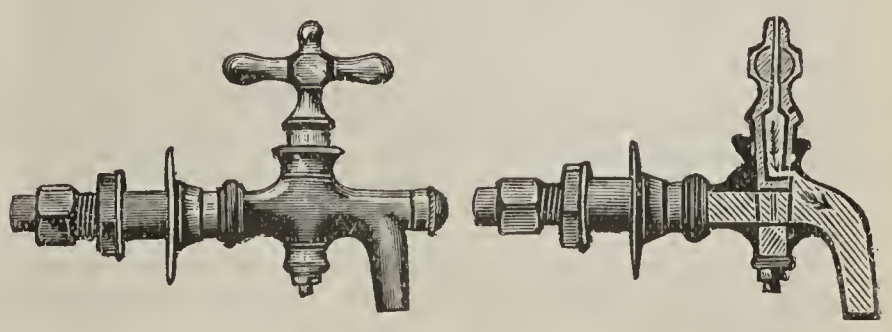


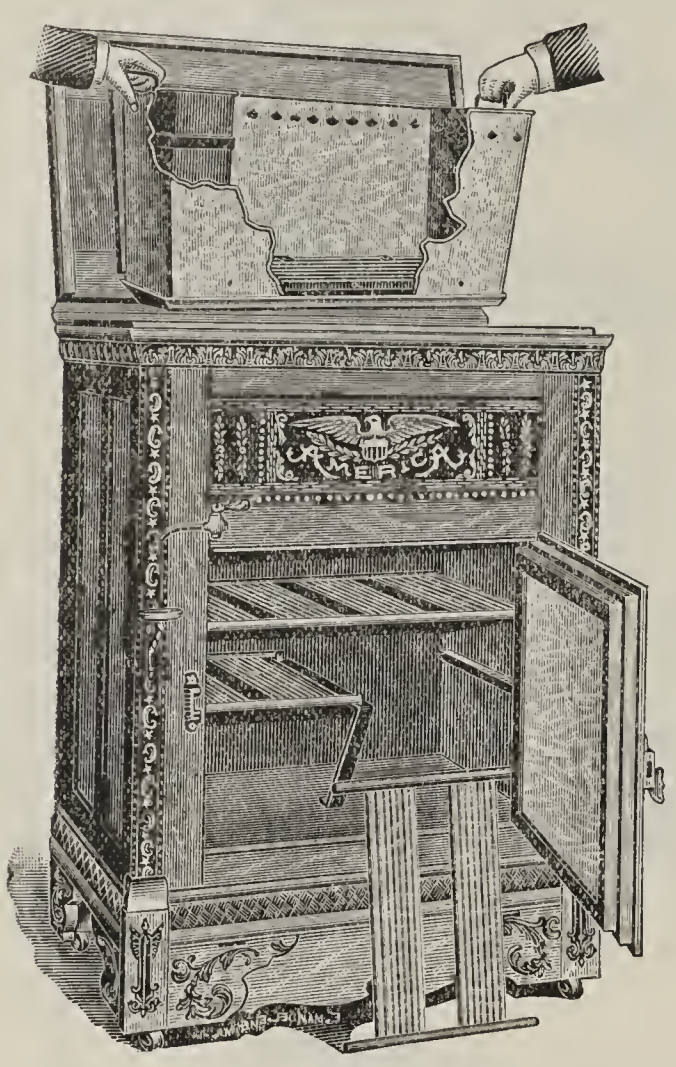
Fig. 1.—*Vent Nose Faucet, with Clean Out.*

Fig. 2.—*Sectional View of Vent Nose Faucet, without Clean Out.*

nose, so that when the liquid is cut off the air pressure being equalized top and bottom allows the material by gravitation to run out immediately instead of gradually, the air passage being indicated by the arrows in sectional view. Another modification of the form of faucet for urns, &c., is also offered in connection with gauge faucets. The portion to which the gauge glass is fixed is separate from the faucet proper and attached to the urn, so that should the faucet need attention it can be unscrewed and repaired without disturbing the glass at all or risk the breaking of it. This style is also made with loose cap for cleaning. Mr. Fisher manufactures in addition full lines of regular faucets for coffee, tea and hot water urns and confectioners' and hotel brass work.

The New America Refrigerator.

The Bowen Mfg. Company, Fond du Lac, Wis., have brought out the new America refrigerator for the season of 1898, as illustrated herewith. The refrigerator is fitted



The New America Refrigerator

with a patented removable galvanized ice compartment-shown lifted out in the cut. It also has a separable, re, movable porcelain lined water cooler. As these parts and the racks can be easily taken out, the interior of the refrigerator is thus accessible for cleaning with the least trouble. No weak attached bottoms are used. In the provision chamber a center removable shelf rest is placed, to accommodate parted shelves for convenience in storing jars or other tall articles. In the illustration the lower rack is shown with one-half lifted out for this purpose. The shelf rest can easily be taken out if a high space across the entire bottom is desired. These features will be appreciated by housewives who find it necessary to use every inch of space to advantage in storing provisions to be kept cool. It is stated that in the construction of this refrigerator a perfect interior circulation of air is secured, so as to get all the benefit from the ice in reducing temperature. The arrangements for draining are such as to secure a quick exit of the water. The walls are lined with charcoal sheathing and are filled, including the bottom, with mineral wool. The consumption of ice is claimed to be very economical. The joints surrounding all openings are carefully sealed, so as to guard against the admission of warm air at such points. The trimmings are of the latest design, manufactured especially for the company's use. The exterior of the refrigerator has received much attention, and the general design is regarded by the company as a model of its kind.

A. J. Patterson has succeeded J. J. Williams in the retail Shelf Hardware, Stove and Tinware business in Griggsville, Ill.

F. E. Sovey has commenced the erection of a new Hardware store on Woodside avenue, Essexville, Mich. Mr. Sovey expects to be ready for business about April 1. He will handle a line of Shelf Hardware, Stoves, Tinware, Bicycles and Sundries, &c.

MEMORANDA.

The proposed consolidation of Enameled Ware interests, which has been the subject of many meetings and negotiations between manufacturers in this line for the past two or three months, is announced to have fallen through. The cardinal difficulty, which caused the abandonment of the plan, was the question of the valuation of the different plants to be included in the combination. The fact, also that two or three important concerns could not be induced to take part in the project no doubt had an influence on the minds of its promoters when it came to a final decision. It is not believed that the formation of any consolidation of the kind will be undertaken again for some time to come.

Among the new goods in Enameled Ware made this season by the Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, are a line of Turk's Head Corn Cake or Lemon and Muffin Pans on frames.

The Hardware and Stove store of Panchot, Hunsicker & Co., Akron, Ohio, was damaged by fire on January 28 to the extent of $10,000. The loss is stated to be fully covered by insurance.

R. Garrett has opened a new Tinware store at Malvern, Pa.

Greer & Peters is the title of a firm who have opened a new Hardware and Tinware establishment at Lewiston, Minn.

The Knoxville Tinware Company, Knoxville, Tenn., are building a plant for the manufacture of Tinware.

Allen & Nichols, wholesale and retail Hardware and general Builders' Supplies, Raleigh, N. C., have removed to their new store, 214 South Wilmington street. They will shortly add to their stock Hubs, Spokes, Rims and a line of Stoves and Tinware, and state that they would like to have catalogues and quotations.

W. A. Kuhlman & Co. have succeeded H. E. Kuhlman & Co. in the Hardware, Stove and House Furnishing business, 620 South St. Clair street, Toledo, Ohio. Many improvements are being made in the old premises by the new firm.

Goodrich Bros., Winchester, Ind., have sold their stock of General Hardware, Stoves, &c., to Frank McDaniel, Fort Recovery, Ohio.

Doan & Pegan have recently put in a new stock of Hardware, Stoves, &c., at De Graff, Ohio. Mr. Doan was formerly connected with the firm of Wiegman & Doan of the same city.

Mason Bros. & Co., formerly in business in Liberty, Neb., have purchased the Hardware stock of Gunn & Reeves, Red Oak, Iowa, and will continue at the old stand, handling Shelf and Heavy Hardware, Stoves and Tinware, Sporting Goods, &c.

Chas. E. Green has opened up a new Hardware store in Alfred, N. Y., carrying a line of Shelf Hardware, Tinware, Plumbing and Furnace Goods, &c.

R. M. Hewitt expects soon to open a new Hardware store in Grand Marais, Mich. Mr. Hewitt will wholesale and retail Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c.

The Annealing of Cast Iron.*

The writer had the pleasure in May last of reading before this association a short article on "Malleable Cast Iron" with special reference to the chemical specifications. The most characteristic part of the process, the annealing, has not until very recently been at all understood. It was generally known that the carbon of the casting was oxidized by the oxygen of the packing, since the carbonic oxide could be seen burning at cracks in the luting during certain stages of the process, and further than that analysis showed that part of the carbon had been removed. Several writers on metallurgy treated this subject in a very non-committal way—saying that the oxygen of the air oxidized the carbon, a statement true enough where annealing in sand or like substances was the method described, but these writers carefully refrained from explaining how it was done in the Reaumur process. For if the air were the source of oxygen we should hardly expect to find the packing reduced nearly to the metallic state as it is in some cases. One writer in a book published in this city in 1872 advanced the idea that the dissociation of the carbonic acid contained in the gases of combustion was the true explanation, though his assertion was unsupported by any evidence. This view was at least plausible. Then the second difficulty was how the car-

*Read by George C. Davis, chemist to Thos. Devlin & Co., Philadelphia, before the Foundrymen's Association at Philadelphia January 5.

bon in a solid body could combine with the oxygen of the packing—a very stable substance not dissociated by heat—as it evidently did. The carbon from the casting for ⅛ inch or more had united with the oxygen of the inclosing packing, but how the two got together was an unsolved problem.

It remained for an English metallurgist to show that the process was one of diffusion. Thus if two bars of steel, one high carbon and one low carbon, are heated in contact with each other to a temperature of about 900 degrees C. the carbon diffuses gradually from the one to the other. This experiment was conducted in a porcelain tube in vacuo. And it is a similar diffusion that brings tne carbon of the casting into contact with the oxygen of the packing.

At the meeting of the British Iron and Steel Institute held in May of last year there was presented by G. P. Royston a paper on "Malleable Cast Iron," which with the discussion that followed has doubtless been read with great interest by makers of malleable castings in this country. This paper, so far as it presents what we may call the practical details of the process, brings out certain marked differences between British and American prac tice, so comment from the latter point of view may be of interest. Both Royston and Hadfield take the ground that manganese in appreciable amounts is injurious. The pig iron used in the experiments contained 0.112 per cent. and the casting 0.043 per cent. manganese, thus showing more than the usual loss in melting. I have never found any good casting that was made in this country that ran as low as this, even those made from charcoal iron exclusively. The average analyses of three typical brands of charcoal iron for the past year show for the No. 2 grade 0.24, 0.32 and 0.45 per cent. respectively, and for the No. 4 grade of the same brands 0.19, 0.14 and 0.18 per cent. The leading brands of coke malleable run still higher in this element; one contains from 0.60 to 1.00, another 0.60 and a third well-known brand from 0.20 to 0.50. A few concerns use small quantities of pig containing 3 per cent. manganese, but this is with a view to producing a smooth and solid casting free from pin holes. We see from these figures that it is impracticable with the pig at our disposal to produce castings as low in manganese as is held to be absolutely essential by the British writers, even were this result desirable. And I do not think that it is. In this country the most common practice is to make a mixture containing from 0.40 to 0.80 per cent. manganese, which would give from 0.20 to 0.40 per cent. in the castings.

Whatever reason there may be for claiming that castings containing manganese anneal with difficulty, since carbide of manganese and iron is more difficult to decompose than carbide of iron, the fact remains that according to the writer's experience in actual practice castings of the composition mentioned above are annealed without the slightest trouble, the combined carbon being below 0.10 and frequently only a trace; the graphite of course depending on the cross section of the casting and time of annealing. A number of tests and analyses by a Western concern show silicon, 0.75 to 0.98 per cent.; manganese, 0.35 to 0.53 per cent.; tensile strength, 39,600 to 53,700 pounds; elongation, 3.85 to 7.83 per cent. Unfortunately, the carbons are not given, but it is obvious that to obtain these results the annealing must have been good. Sulphur, if present in large amounts, interferes with annealing, as was shown in a paper by H. R. Standford, read before the American Society of Civil Engineers in 1895.

In melting iron in an air furnace using a coal containing 1.12 per cent. sulphur I found the metal gained not over 0.03, so that the casting never ran over 0.06 per cent. Some castings are made from iron melted in a cupola, and here it occasionally happens from bad fuel or irregular melting of the sprues in the charge that the sulphur runs too high. In a previous paper I referred to an extremely tough casting containing 0.121 per cent. sulphur. This casting was about ⅛ inch thick, and had the carbon practically all removed. In the case of a thicker casting where the annealing did not remove all the carbon I found a slightly larger amount of sulphur sufficient to prevent complete annealing. A casting ⅜ inch thick after once annealing showed sulphur, 0.133 per cent.; graphite, 0.547 per cent.; combined carbon, 0.515 per cent.; after a second annealing, graphite, 0.505 per cent.; combined carbon, 0.380. Using the best fuel obtainable and the greatest care in charging it is possible to melt iron in a cupola wthout adding more than 0.03 per cent. sulphur, but I find that few works can show as good results as this, and more often 0.06 or over is added than the former figure. West Virginia ccke running from 0.50 to 0.65 per cent. sulphur and Connellsville at about 0.85 per cent. can be easily obtained, so it is entirely practicable to produce castings from cupola metal running below 0.11 per cent. sulphur, an amount not objectionable in the class of castings made from this iron.

The difference between Reaumur's process, where the carbon is wholly or partially removed, and the process described by Forquignon, where it is simply changed to graphite or decarburized and transcarburized respectivley (as one author puts it), is fully brought out in the discussion of Mr. Royston's paper. Many manufacturers of malleable iron in this country do not understand this matter. Some of them use various processes for annealing which do not decarburize to any appreciable extent, under the impression that they are producing Reaumur castings. A number of processes for the production of malleable castings have been proposed by men ignorant of the rationale of the Reaumur process. It is impossible for commercial reasons to discuss them here; suffice it to say they are no improvement and many are obvious frauds, such as the addition of mysterious fluxes in the furnace or ladle just before pouring. In the discussion Mr. Hadfield takes issue with Mr. Royston, who says no bend can be obtained if the graphite is present as in the so called black heart castings such as are produced by annealing in sand or bone ash in luted pots. Mr. Hadfield instances a casting made in this country containing 3.07 per cent. graphite, which could be bent in a manner approaching soft steel and had wonderfully good resisting properties to sudden blows. My own experience agrees in the main with Mr. Royston. While castings containing large amounts of graphite will sometimes bend well, I have never found them as tough as decarburized castings containing equal amounts of the other weakening elements, silicon and phosphorus.

In this country roll scale is used as a packing in preference to ore for several reasons. Ore sufficiently low in silica would be more expensive for works located east of the Alleghanies. Mill scale requires no grinding or other preparation than to oxidize or rust it, as the common saying is, with a weak solution of sal ammoniac. Instead of mixing three or four parts of spent ore with one of raw ore ground to the size of a pea, as described by Mr. Royston, it is the common practice to spread the spent packing on the floor and sprinkle it with a weak solution of sal ammoniac so that the mass becomes oxidized. This spent packing is, of course, finely divided as it falls through the crevices in the tumblers into which the whole charge is placed. The oxidized mill scale is added from time to time, as there is always some loss in handling the packing as dust and in other ways. So far as the pots are concerned no special mixture is made for them. They are cast from cupola metal, if this is available, and last five or six heats, depending on their position in the furnace. A number of types of annealing furnaces are used. Probably in the most efficient type the fire is built in furnaces along one side, the gases entering near the top, passing across the furnace down the opposite side and out of the ports to by pass flues underneath the floor and finally to the stack. Thus all sides of the furnace are heated to a nearly uniform temperature.

Mr. Royston refers to the question of scaly castings without covering the whole ground. In speaking of annealing in sand or bone ash, he says: "The reaction taking place between the carbon and the iron should be $C + O = CO$. Should it be $C + O_2 = CO_2$, the iron will also be oxidized by the carbonic acid and the casting will be scaled." To put it in other words: If you use too much air you will burn the castings. Continuing, the author says: "Where oxides of iron are used as a source of oxygen the carbon monoxide partially reduces the iron oxide to the metallic state." This sentence is of doubtful meaning, but I take it that he intended to say reduces the iron of the scale to the metallic state. It frequently happens that where a number of small castings are annealed in ferric oxide in the same pot some will scale and some will not. I have never found a scaly casting that contained the amount of manganese usual in good castings, and I believe that this element acts to prevent scaling, at least when annealing in ferric oxide. Thus in one case a scaly casting showed 0.08 per cent., and a good casting 0.27 per cent. manganese, both being annealed at the same time. With regard to phosphorus, if the Lorn pig used in Mr. Royston's experiment is one of their representative brands the English founders seem to be running lower in this element than is necessary. I certainly do not believe in adding phosphorus *ad libitum*, but in this country the usual specification is 0.20 or less, and certain it is that castings containing 0 18 (that is about a fair average figure) show excellent results.

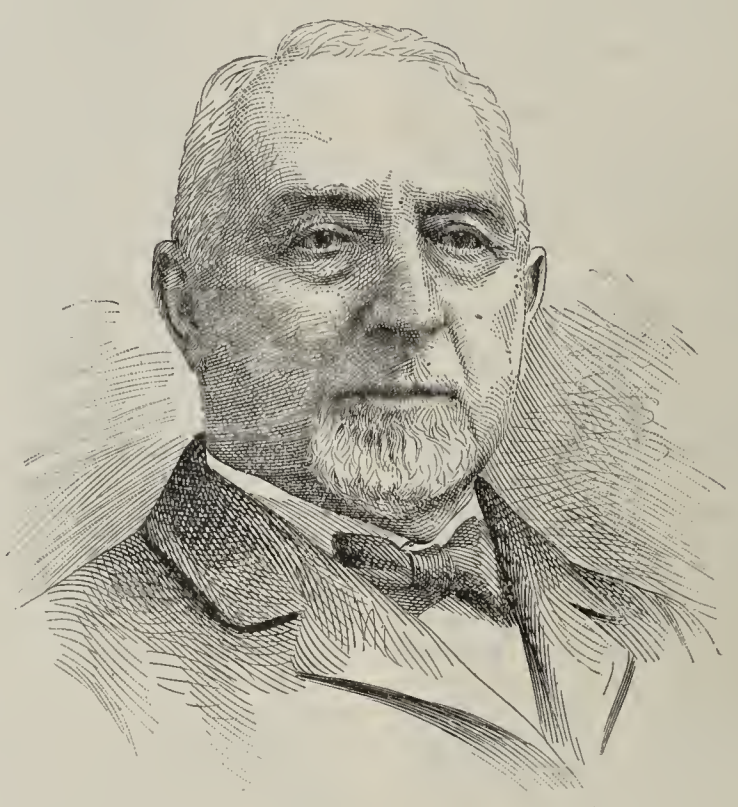
The largest industrial company ever incorporated in New York State are the International Paper Company of Corinth, Saratoga County, N. Y., who received articles of incorporation this week. The capital stock of the new corporation, which is familiarly dubbed the "American Paper Trust," is placed at $45,000,000. All the large paper mills in the East and several in the West are in the combination, which aims to control the paper making industry in all its branches.

Thomas Worthington has been appointed by the British Board of Trade as a special commissioner to visit South America with the purpose of inquiring into the conditions and prospects of trade in that country.

STOVE TRADE NOTES.

William P. Abendroth.

The stove trade of the country has lost another veteran member in the death of William Philip Abendroth, which occurred at his residence, at Portchester, N. Y., on the morning of Saturday, January 29. Mr. Abendroth was born in Germany, December 18, 1818, and at the age of 14 years came to this country with his parents. They resided for a short time in New York, and then removed to Albany, where the young man entered the iron foundry of Dr. Ephraim Nott to learn the trade of foundryman. From this time forward until 20 years of age he improved his leisure in the evenings by attending night schools. In 1834 Dr. Nott transferred his business to New York City and started what was known as the Novelty Iron Works, in which place Mr. Abendroth completed his apprenticeship in 1836. In the same year he left the firm and engaged as journeyman in the foundry of Bartlett Bent in Jersey City, N. J. Mr. Abendroth, however, was anxious to improve his position and circumstances, so in the fall of 1839 he severed his connection with Mr. Bent and journeyed to New Orleans, making the trip in a sailing vessel. After sojourning in the South for a time and visiting some of the principal cities of what was then termed "the West," he returned East and entered the foundry of George E. Waring of Stamford, Conn. Here he remained but a few months, which completed his career as a journeyman.



WILLIAM P. ABENDROTH.

In 1840 he went to Portchester, and with Philip Rollhaus laid the foundation of the present large business of the Eagle Iron & Stove Works, Abendroth Brothers, proprietors. In 1842 an office in New York City was opened, it being now located at 109-111 Beekman street. Upon the retirement from the firm of Mr. Rollhaus in 1845 Mr. Abendroth took into the business his two brothers Augustus and John, and some years later his brother-in law, John D. Fraser. In 1874 John Abendroth withdrew from the firm, but Augustus continued his connection until his death in 1882. In the year 1876 a stock company was formed, with Mr. Abendroth as president, under the title of Abendroth Brothers, they being among the first under the law which then allowed incorporated concerns to retain the old name, and were not compelled to add either the terms "Co." or "Incorporated."

Besides his connection with the stove interests, Mr. Abendroth was prominently identified with practically every public enterprise looking to the advancement of Portchester. In 1863 he assisted in the organization of the First National Bank of Portchester, and was one of its directors for many years. In 1865 he, with several others, secured the charter and organized the Portchester Savings Bank, being elected its president, which office he held until the time of his death. He was also president of the town for four years, besides taking part in various minor organizations. He was the prime mover in the establishment of the Portchester Water Works, and was one of the directors. In fact, it may be stated that Mr. Abendroth was largely instrumental in the building of the town of Portchester. He was a member of the Fulton Club and of the American Yacht Club.

In 1843 he was married to Miss Anna Maria Fraser of Jersey City, N. J., who, with three daughters and two sons, survive him. The funeral services were held on Tuesday afternoon at St. Peter's Protestant Episcopal Church, Portchester, N. Y., in which Mr. Abendroth was a vestryman, the pallbearers being Dr. Norton J. Sands, John Voorhis, Geo. W. Quintard, John W. Lounsbury, Wm. E. Ward and Jordan L. Mott, who represented the various directories and associations of which Mr. Abendroth had been a member.

W. S. Hull.

Wm. S. Hull, superintendent of the Bridge & Beach Mfg. Company, St. Louis, died on Thursday, the 27 ult. He suffered from an attack of *grippe*, which later developed into pneumonia, which was the cause of his death. Mr. Hull was born 56 years ago in Stuyvesant, N. Y. He served in the Union army during the war. In 1877 he came to St. Louis and entered the employ of the Bridge & Beach Mfg. Company, as foreman of the foundry. Later he was made superintendent and became a stockholder in the company. The Bridge & Beach Mfg. Co., in speaking of the deceased, said:

"There is nothing we could add in praise of the character and nature of our departed friend that would not be fully justified by the facts. He was a man of few words, thoroughly reliable and straightforward, a conscientious Christian gentleman in all that the term implies, and to a degree seldom found he won and merited the confidence and esteem of all who knew him. Abstemious in his habits, upright in his dealings, and gentle in his manner, a harsh word was never known to pass his lips, still his control over the several hundred men under him was wonderful. He ruled them by love and not by fear, while at the same time he entered into their lives as only one who is thoroughly humane and kind to his fellow men could. Under a reserved exterior he had a warm heart, and many of the men who worked under him for many years could hardly restrain their emotion as they quietly laid down their tools, when the sad news of his death was received on Thursday morning, and silently left the foundry. To the officers of the Bridge & Beach Mfg. Company he was not only their superintendent, but their friend, and the shock of his sudden death was hard to bear. The memory of his many good deeds and kindly actions will linger with us for many years."

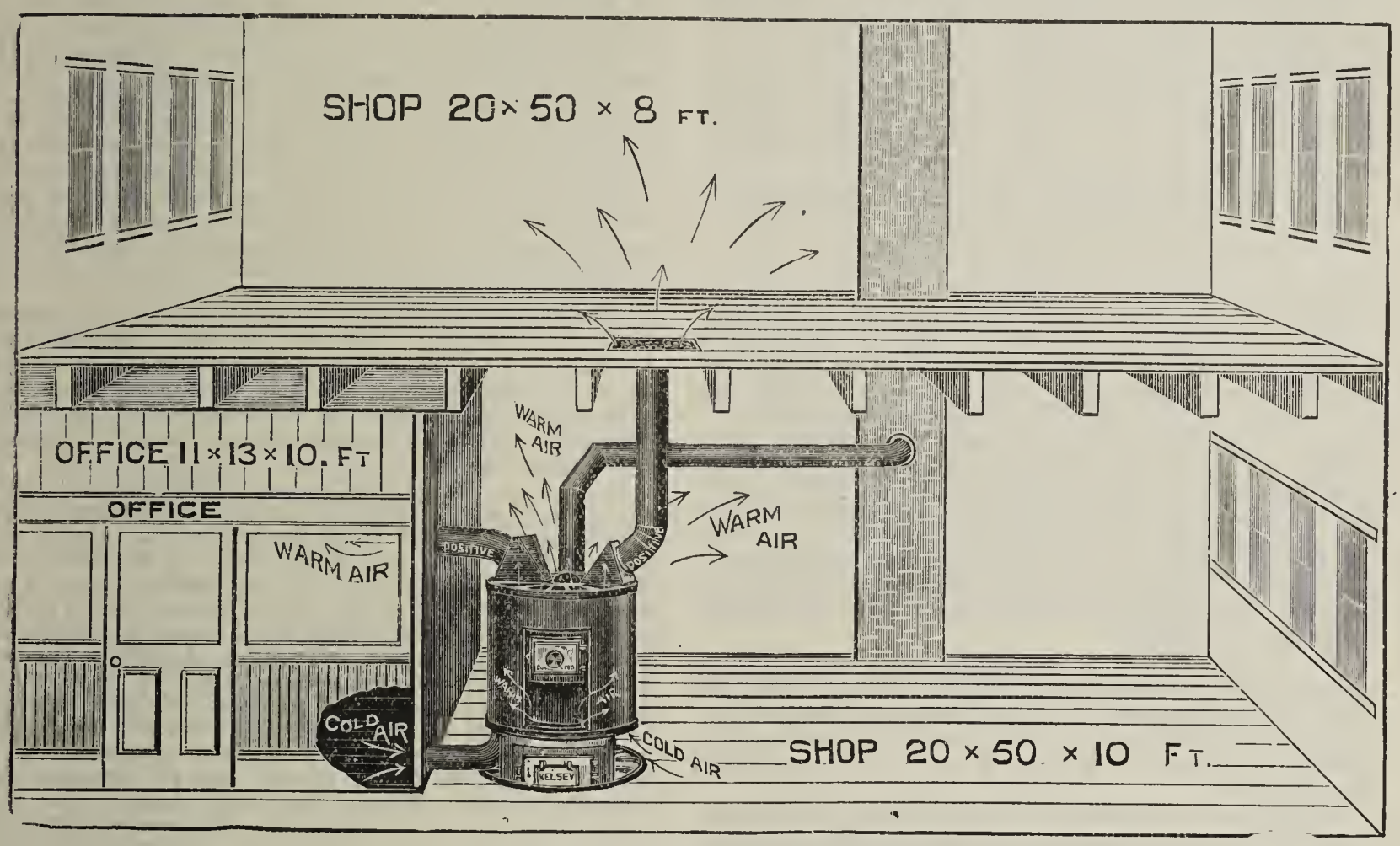
At a meeting of the Bridge & Beach Mutual Aid Association the following resolution was adopted :

Resolved, That in the sad and unexpected death of William S. Hull the members of the Bridge & Beach Mutual Aid Association have lost a faithful friend and conscientious associate, a man whose subordinates respected and honored as a superior, and loved and cherished as a faithful friend. Gentle in his manner, honest in his convictions, straightforward in all his dealings, we sincerely mourn his loss, and tender our heartfelt sympathy to those who were nearer and dearer to him than we.

A Positive Air Delivering Furnace Plant.

The difficulty of securing under all conditions a positive flow of air to some of the rooms connected with a furnace is well known. A method of overcoming such a trouble is described in a letter received from L. R. Lewis, Cortland, N. Y., which we give below, with the sketch accompanying the letter:

Thinking some readers of *The Metal Worker* may be interested in knowing what may be accomplished with hot air heating in the way of absolutely warming various portions of a shop or other building, I submit the sketch and following descriptive matter of results I have attained in this direction. I have placed on my lower shop room floor a No. 14 Kelsey warm air generator, made by the Kelsey Furnace Company, Syracuse, N. Y., erected complete, without the outside galvanized iron casing. In this way the cold air on the floor has free draft and circulation up through the hollow, corrugated sections forming the fire pot and combustion chamber of the heater. My office is a tightly partitioned off portion of the southwest corner of my lower shop room. The heater is located about 5 feet from one corner of the office partition. I have placed a positive cap attachment over two of the hollow corrugated sections above referred to, and connecting this positive cap with a 10-inch round tin pipe to a register face located in side partition of office, about 5 feet above floor, and introduce into the office such a constant flow of heated air as to make it comfortable at all times. To remove the cold air from the floor of this pocketed office room I have provided a return pipe back to the heater, taking the cold air through a register face located in the partition near floor. For heating my upper shop room, occupying the entire second floor of my building, a room 20 x 50 feet, I have capped three of the hollow corrugated sections with a positive cap attachment, and use a 12-inch pipe to conduct the heated air direct to the second floor room, and by this means it is always thoroughly heated, assisted as it is by heated air from first floor, which arises through a single open stairway near rear part of shop. The shop on first floor is thoroughly warmed by the heated air being freely delivered in it after passing through the hollow corrugated sections not capped. The radiant heat from the heavy steel casing also assists in making comfortable the first floor shop room. Thus it will be seen that with this heater, without even the expense of an outside galvanized iron casing, I am heating a separately partitioned off office room, a large shop room on level with the heater, and a shop on the second floor. I have never used over 4 tons of coal any season. This is the fifth winter the heater has been in use and it is as perfect to-day as five years ago.



A Positive Air Delivering Furnace Plant.

ODD PLATES.

The latest card distributed by Isaac A. Sheppard & Co., Philadelphia, Pa., in the interest of their serviceable book, "Hints About Heating," is decorated strikingly in black and yellow. A somewhat gayly dressed young lady from the State University of Illinois adds to the charm of the announcement, which is to the effect that "Hints About Heating" has been adopted by the university as a text book in its Department of Architecture.

The Cleveland Foundry Company, Cleveland, Ohio, set forth the merits of the Puritan Wickless Blue Flame Cooking Stove in a neatly printed pamphlet, which has just been issued from the press. The manufacturers state that after two years of patient experimentation they have succeeded in "perfecting an Oil Stove which burns kerosene oil without a wick and makes a blue flame the same as gas or gasoline without smoke or odor." The point is also made that it is so constructed that it will burn gasoline without alteration, is extremely simple in construction and "a perfect operating Stove with either fuel." The claims made for the Stove are set forth at considerable length, numerous illustrations being given to elucidate some of the more complicated features. Various styles of the Stove are presented, together with a line of Ovens for use in connection with them; also Puritan, Triumph, Defiance and Model Lamp Stoves, Extension Tops for Lamp Stoves, Ovens for Lamp Stoves, Broilers, Sad Iron Heaters, Registers, &c. The company state that they also manufacture Puritan Oil and Gas Heaters, Puritan Gas Ranges and Puritan Hot Plates, for which separate catalogues are issued. The pamphlet under consideration is printed in green ink and bound in colored paper covers printed in red and black.

A transformation is going on in the interior of the Chicago warehouse of the Excelsior Steel Furnace Company, at 38 and 40 West Monroe street. New platforms

are being built, bins are being enlarged and additional ones constructed in order to make room for the very much larger stock of Furnace Fittings and other goods which the Excelsior people propose to carry during the coming season. An immense Register rack is also assuming shape, and another large rack for taking care of cut lumber for crates is being put up in the basement. Space is also being provided for the new line of Sectional Wall Pipe, which the company will place on the market about March 1, a stock of which is now being manufactured.

The Kelsey Furnace Company, Syracuse, N. Y., will be represented this year in New York and Pennsylvania by E. H. Bradley, in Ohio, Indiana and Michigan by A. Hopkins and in the New England States by M. J. Kelsey.

Graff & Co. of Pittsburgh, Pa., have recently leased the eight-story building 817 Liberty avenue, that city, the structure covering an area 20 x 110 feet. The building is modern in all respects and the company intend to take possession the present week.

The annual meeting of the stockholders of the Syracuse Stove Works, Syraucse, N. Y., was held on the afternoon of Wednesday, January 26, when the following directors were elected: Francis Kernan, Joseph F. Kernan, William S. Doolittle, N. E. Devereaux, S. G. Finck, William T. Baker and W. H. Landers. At a meeting of the Board of Directors the following officers were elected: President and treasurer, Francis Kernan ; vice-president, S. G. Finck, and secretary and manager, W. H. Landers.

The Mount Penn Stove Works of Reading, Pa., resumed operations in all departments on Monday of last week, having been shut down temporarily for the purpose of making some repairs and taking annual account of stock.

The Dighton Stove Lining Company of Dighton, Mass., recently held their annual election, choosing Stephen H. Pierce president. The directors elected were Stephen H. Pierce, George H. Horton, W. Z. Witmarsh and G. C. Francis.

J. F. Hawken has been appointed general superintendent of Bridge & Beach Mfg. Company's foundry, to fill the vacancy caused by the death of W. S. Hull. Mr. Hawken entered the employ of the company 22 years ago at 17 years of age, and has a thorough knowledge of foundry practice, having worked as molder, stove mounter, then foundry bookkeeper; has been assistant superintendent for several years, and is eminently qualified to fill the position of general superintendent. Joseph T. Dugdale, for over 20 years past president of the Western Stove Company of St. Louis, has severed his connection with that company and has been appointed foundry foreman and assistant superintendent of the Bridge & Beach Mfg. Company.

The Hudson Stove Works of Hudson, N. Y., will be represented the ensuing year by Ed. H. Lisk, who will travel in the interests of the company in Eastern New York and Massachusetts, and Frank T. Panderson in Central, Northern and Western New York, Vermont and New Jersey.

The Chicago & Erie Stove Works, John Depinet and John Liebel, proprietors, Erie, Pa., are now running full blast, the company having taken up the manufacture of Invincible and Superb Helper Steel Ranges where the old concern left off.

The Illinois Steel Company.

Some interesting information is given in the financial news department of a Chicago daily relative to the Illinois Steel Company, as follows:

"The Illinois Steel Company are steadily improving their financial condition. The note for $1,500,000 given a year ago fell due Friday, and the company had no trouble in taking care of it. A third of the principal had been paid off during 1897. About one-half of the remainder was paid at maturity, and the balance, about $500,000, was renewed on easy terms. The company have been enjoying a large increase in business. but not all of these funds came from that source. They owned a large amount of stock in the Western Coke Company of Pittsburgh, and they recently made an advantageous sale of $850,000 of that stock. They received $400,000 in cash, and the balance is to be paid in installments. It will be observed that the deferred payments on these securities will take care of the bulk of the sum still due on account of that $1,500,000 note.

"It is asserted the Steel Company will in no way weaken their position by the sale of the coke stock. Possibly the sale may be taken as an indication that the company are counting on being able to produce their own coke from Illinois coal, as the result of their long series of experiments, which are said to have resulted in a practicable process for coking the coal of this State. The Steel Company have further improved their position by transforming the large supply of ore on hand last year into cash. It is assumed the company will not soon be caught again with such a large supply of raw material on hand, and this will result in a large saving in interest."

How English Houses are Heated.

In a late number of the *Engineering Magazine* is an interesting article on "European Systems of House Heating," by J. L. Saunders, from which we quote as follows:

The average English boiler seems to be constructed with but little consideration for the amount of fuel it will consume, and its grate and heating surfaces seem to be proportioned, not according to any set rules or ratios, but purely by guesswork. Many a boiler manufacturer of Great Britain, if asked the size of the grate surface or fire surface of his boiler, or its rating in proportion to its grate and fire surfaces, would look in astonishment and ask the purpose of the question. In many cases, indeed, he could not tell. With but very few exceptions the boilers made in Great Britain are of wrought iron, either welded or riveted, and are made in one piece, requiring to be brick set. Almost invariably this setting is done according to the individual idea of each heating engineer or heating contractor. The boiler manufacturer does not have any particular design for setting the boiler bought from him. Thus it may be seen how vague are the statements of the rating of a boiler, as this depends a good deal on how it is set.

Nearly all the manufacturers make the same style of boiler, the only difference being that each has his own name. The only competition is in price. But within the last few years some manufacturers have begun to produce and push patent boilers of their own, using as strong arguments for their special type its advantages in construction, style and heating power in comparison to fuel consumption. A few years will no doubt witness vast improvements in the boilers for heating systems in Great Britain. Most of the new boilers put on the market at present are of the American style and do not require to be brick set; they are called independent boilers, but they are made of wrought iron.

The British people are somewhat prejudiced against the cast iron boiler, for just what reason it is hard to tell. No doubt one reason is that cast iron boilers so far produced in Great Britain have been cast in one piece, have been very heavy because of the thickness of metal, and may easily be broken because of unevenness of expansion and contraction, as well as unevenness of thickness. It is asserted, also, that if a boiler is of wrought iron, made in one piece, there is less likelihood of leakage than in a cast iron sectional boiler which has to be put together with many joints. This is a point open to discussion. Although there is this prejudice in England against cast iron boilers, it is no doubt dying. I have used a number of American cast iron boilers in recent contracts, and several firms are using and selling American cast iron sectional boilers in Great Britain to day. In fact, there is one English firm that is putting on the English market a cast iron boiler of American manufacture, though sold under another name. Although the larger number of boilers in use in Great Britain are of wrought iron, either brick set or independent, both classes show great variety in type, style and mode of construction—especially in the arrangement of flues, cross tubes and narrow flues. The greatest objection to the independent boiler is that, as a rule, it has no covering, and therefore is giving out a great deal of its heat where it should not. Indeed, the commonest fault with British boilers is that they are great fuel consumers.

The low pressure hot water system is the one most largely used in Great Britain, but its chief application is to the heating of schools, churches and public buildings. Very few residences are heated in any way except by the open fire place, although of late years far more of the owners of large residences and mansions are putting in some one of the newer heating devices, using it, as a rule, as an auxiliary to the open grate, which holds its own because it ministers to the natural love of the sight of an open fire and the maintenance of good ventilation. Low pressure steam is but little used, as it is often considered to give too high a temperature for the heating of buildings. Another reason may be that its installation is not well understood, some very bad results having been produced. The two-pipe system is used, and the principal trouble has been that the returns have not been properly taken care of, with the result that water hammer has run riot. The one-pipe system is but little known, and the British architect is rather a difficult person to convert to new ideas. There are a few firms in Great Britain who are now doing considerable steam heating, using one-pipe work; and very good work indeed they are doing, for there is no question that, when the Briton goes in for good work, he does the very best. The fan system (or plenum, as it is called in Great Britain) has only of late come into use, and only in large public buildings, but it bids fair to become prominent. It is installed in Great Britain in a manner somewhat different from that prevailing in America; more often than not low pressure hot water is the heating agent instead of steam. Instead, however, of making one large heating chamber, from

which the warmed air is blown through tubes to the upright flues and thence to the different departments in the building, the heating surface is subdivided and the small units placed at the foot of each individual flue and cased in. A brick tunnel leads from the fan around the building (under the ground floor), and from this tunnel the air is supplied to each stack of heating surface and regulated at the bottom of the separate flues. There are, of course, many ways of installing the fan system and of regulating the supply of warm fresh air and of taking out the foul air. Where low pressure hot water is the heating power a gas engine is used to drive the fan.

The high pressure hot water system (known as the Perkins system) was at one time very largely used in Great Britain, but of late is less often installed. In this system the boiler is simply a coil constructed of very heavy wrought iron pipe and incased in brick work. From this coil are run strong 1-inch pipes with ⅝ or ⅞ inch bore. The circuit is generally continuous, with no valves and no means of shutting off any part of the apparatus; the heat must be either on or off for the entire building. In some cases, however, there are several circuits with valves and by-passes to each circuit. The pipes are put together in a very strong manner, for they have to withstand a heavy pressure. The joints are connected by right and left hand couplings. The joint is not made by tightening on the threads. The ends of the pipes are made one convex and the other concave, and the process of tightening the couplings butts the two ends of the pipe together. The same kind of joint is made with all fittings, and the fittings are all made of wrought pipe of heavy gauge; where bends (or elbows) are required the pipe has to be bent by the use of a fire. The system is run at a very high temperature and, as it is entirely sealed up with but a small air chamber or air cushion, the pressure is very great. The principal objection is the unevenness of temperature, caused in the following way: When the fire is on the water does not circulate slowly, as in a low pressure system, but stands still until a high temperature is reached and then goes through the pipes with a rush. As soon as the fire drops the circulation stops and the heat soon dies down.

The use of hot air heating in Great Britain is very small; in fact, about the only system used is the Grundy, and that principally in churches and schools. It is different from the practice in America, which commonly involves the use of a furnace with tin flues.

The systems of low pressure hot water heating in use are much the same in both countries, the three principal being the rising system, the drop system and the one pipe system. In the first the flow and return are duplicates one of the other, and the mains run side by side, or one above the other, in the basement cellar or in trenches below the ground floor, branches rising from these mains. In the drop system a main riser is taken to the highest point of the building and a main run around the top of the building, and from this main are taken drop pipes which supply the heating surface on their way down, the flow and return to the coil, or radiator, being from the one drop pipe; then all the different drop pipes are gathered into a main return pipe below the ground floor and returned to the boiler. The one-pipe system consists of one large main, in basement or cellar, which main is of the same size throughout. Its highest point is at its exit from the boiler, and it has a gradual fall all the way till it enters the return. This one pipe is used for both flow and return, the flow branches leaving the top and the return branches entering at its side.

Although the systems are much the same in both countries they vary in detail. All three systems have been more fully developed in America. The rising system is most frequently used in Great Britain, the other two systems named being less often met, although I have put in several since my return to England. As to style of work, America is far in advance, but the large demand for heating and the great competition account for the superior quality of American work. The demand for heating systems has been comparatively small in Great Britain, as the country has been satisfied to go on in its old lines; but, as the demand increases, improvements are made and some very fine systems are now being erected. Indirect heating, for example, which until very recently was hardly known, has been introduced in several large and handsome residences, the work being of the very best class. The indirect stacks are incased in chambers constructed of the finest glazed bricks, so arranged that access can be had for cleaning. The registers are of solid bronze metal of Tuttle & Bailey's best manufacture. Several strong principles which have been allowed to govern the erection of heating plants in Great Britain have prevented the work from presenting the most pleasing effect. One of the most prominent is the prevailing use of cast iron pipe, heavy and clumsy in appearance; it has to be adopted in many cases for the reason that the water is so bad that it destroys or fills up the wrought iron pipes in a very short time. This has limited the demand for wrought iron pipe, especially in sizes more than 2 inches in diameter, and, as a natural result, the prices of all the larger sizes are very high. No doubt, to an American, a very peculiar appearance would be presented by a heating job wherein the mains were of cast iron pipe in lengths of 9 feet, with spigot and socket joints calked together with either rust joint or red and white lead and spun yarn; nevertheless a great part of the work in Great Britain is done in this manner. Again, much of the heating surface is constructed of coils made of cast iron pipe, 2 inches and upward in diameter, put together in the manner described above. In greenhouse work cast iron pipe is always used, and, as a rule, the joints are made with india rubber rings, known as india rubber expansion joints. Another point affecting heating plants in Great Britain is that comparatively few of the buildings have basements under the whole house. This makes it very difficult to get in mains, and the result is that the mains are made as short as possible, and the different rooms are heated by running long coils from room to room, making long circuits with short mains, to avoid very heavy expense in making channels, trenches or tunnels below the ground floor. At one time there were but few radiators in use in Great Britain, the heating surface being usually of cast iron pipe and cast iron coils; but now the public is beginning to desire them and architects to specify them. But the Briton has little desire for decoration. It is generally his request that the radiators be put out of sight as much as possible. There is no doubt that the heating business in Great Britain is improving very much, and that the class of work is growing better every year and patterning more after American practice; but no doubt it will be some time before buildings are heated throughout and each room controlled by a thermostat.

Packing Goods for Shipment to the South American Republics.

From C. Dolge, who has charge of the American warehouse at Caracas, Venezuela, it was learned that much delay and displeasure is experienced by both shipper and consignee in shipping goods to the South American Republics. This is due to the ignorance of the shipper regarding the packing rules and regulations in vogue in the various countries.

As the volume of trade between this country and our Pan-American neighbors increases these complications will also multiply. To prevent this as much as possible *The Metal Worker* has secured a copy of these rules.

Marking.—There is no restriction whatever placed on marking in any of the countries, with the exception of Colombia, Ecuador, Honduras and Nicaragua. In these four countries it is necessary to be restricted to one uniform mark for each consignee. Two marks will require two sets of bills of lading.

Numbering.—In Brazil, Chili, Honduras, Peru, Uruguay and the Argentine Republic, each package, piece, &c., must bear one individual number, each differing from the other.

Bolivia, Colombia, Costa Rica, Cuba and Porto Rico, Ecuador, Guatemala, Hayti, Mexico, Nicaragua, Paraguay, Salvador, Santo Domingo and Venezuela provide that packages of the same kind may be numbered alike. Do not mix two different kinds of packages under the same number.

Weight and Measurements.—In Bolivia, Chili, Colombia, Costa Rica, Guatemala, Hayti, Honduras, Paraguay, Peru, Salvador, Santo Domingo, Uruguay, Venezuela and the Argentine Republic, it is required that gross and net weight and measurements of liquid and dry goods be given in metric system for each package. Hayti does not insist on metric system. Ecuador, Nicaragua and Cuba and Porto Rico require only gross weight for each package. They use metric system. Brazil and Mexico require gross weight of package, net weight of parcels inside of package, and actual weight of the goods, also measurements of liquid and dry goods for each package, in the metric system.

Contents.—Only one kind of merchandise can be packed in one package sent to Argentine Republic, Brazil, Bolivia, Cuba and Porto Rico, Ecuador, Peru, Salvador and Venezuela. For Colombia, Costa Rica, Guatemala, Hayti, Honduras, Mexico, Nicaragua, Paraguay, Santo Domingo and Uruguay packages may contain several kinds of merchandise packed together. The weight and measurements of each must be supplied. For Chili several kinds of merchandise may be packed together, but there is no restriction as to the supplying of the weight and measurement of each.

Charles F. Iseminger, the oldest member of the Philadelphia City Council in point of service, died on January 29. Mr. Iseminger was born in 1826 and in 1850 engaged in the plumbing business with William R. Shepherd and continued in that line of business until his death. He was an active volunteer fireman and for 21 years was treasurer of the Marion Hose Company. He was a member of the Historical Society of Pennsylvania.

TRADE REPORT.

METAL MARKET.

Pig Tin.—The market has been rather quiet throughout the week, owing partly to difficulty in moving stock because of the storms and partly to the fact that deliveries on previous purchases are supplying the wants of numerous consumers to a considerable extent. However, prices are holding up remarkably well. London prices have varied in a slight degree only, but show a fraction advance for the week. Retail business has been of fairly large proportions, and small lots of Straits from jobbers' hands are generally quoted at about 14½c. per lb. Statistics posted on 'Change show the visible supply on the 1st inst. to have been about 31,130 tons, against 29,855 tons at the beginning of the preceding month and 32,332 tons a year ago. The spot stock in the United States, exclusive of the Pacific Coast, is placed at 3210 tons and the quantity afloat at 2250 tons. The month's increase in visible supply is due to larger European stocks. The shipments from the Straits during January were heavy, including 2100 tons to Great Britain, 1350 tons to the United States, and 1200 tons to the Continent.

Copper.—The export movement is still good and serves to keep the market quite firm, despite the fact that home consumers still buy very sparingly. Sales by jobbers were merely moderate and inquiry not of any large proportions. Dealers' prices for small lots from stock rule at 12¼c. per lb. for Lake Ingot and 11¼c. for Ansonia Grade Casting Copper. It is figured out that the exports from the United States last month were 9571 tons of fine Copper and 1189 tons of Matte, or the equivalent of 10,225 tons of fine Copper all told, against 9066 tons in the corresponding period last year. The European visible supply was cabled as having been 29,740 tons on January 31, against 31,080 at the middle of the month, and the January deliveries were placed at 17,400 tons.

Sheet Copper.—Sales show some improvement and there is more inquiry, but the volume of current business, all told, is not large. This is normally a dull season in the cornice trade, however, and little beyond buying for present reuirements is looked for. The outlook is favorable, nevertheless, for a bigger business than last year, as the amount of projected building of the kind in which Copper plays a part is quite large. Prices are still unsettled, and the market for Sheet Copper is an open one. Dealers quote anywhere from 14c. to 16c. per lb. basis for small lots.

Pig Lead.—Wholesale prices have weakened under the weight of continued indifference on the part of large consumers and moderate business in other quarters, together with somewhat freer offering. In the retail trade dullness still reigns supreme. Sales are limited almost entirely to small lots for current use. Dealers quote American Pig in small quantities at 4⅛c. per lb.

St. Louis advices indicate an extremely quiet market. Consumers appear to be pretty well supplied and are not willing to pay prices named by holders.

Lead Pipe and Sheet.—The demand for these materials is very tame. Jobbers in this section quote Pipe at 5½c. and Sheet at 6½c. per lb., subject to the usual trade discount.

Spelter.—Business of only fair amount has been effected, and the demand at present is slow, Eastern consumers buying in a hand to mouth way only. Prices are held quite steady, however. Good Western brands in small lots from store are quoted at 4.40c. to 4.50c. per lb.

St. Louis advices are as follows: Spelter is without any feature of interest. Producers appear satisfied with the price at present prevailing, and do not appear to be making any special efforts to get higher figures. The demand is only moderate.

Sheet Zinc.—Sales are of a routine character and the demand moderate. Prices have not varied, jobbers quoting 600-lb. cask lots at 5⅝c. to 5¾c. per lb., and smaller quantities at 6⅛c. to 6¼c.

Antimony.—The demand continues fair and prices for small parcels from store remain at about 7¼c. for Japanese, 7½c. for Hallett's and 8½c. for Cookson's.

Nickel.—Sellers quote small lots at 38c. per lb.

Aluminum.—The demand for this metal is referred to as good. Prices are as follows: No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots. is quoted in small lots at 40c. per lb.; 100-lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb.; 100-lb. lots, 33c., and special Casting Alloy. containing over 80 per cent. pure Aluminum, used in place of Brass, 35c per lb.; 100-lb. lots, 30c.

Tin Plate.—A slight improvement was reported over last week on orders for American Cokes for delivery within the next two or three months, but, as a whole, the business effected was of only fair amount, while the prices at which recent contracts were put through are understood to have been very low. Offerings for both spot and forward deliveries were rather more free and the market, as a whole, showed further indications of weakness. The negotiations now going on between the manufacturers, looking to a combination or consolidation of interests, undoubtedly tend to keep the larger consumers out of the market for the present and tend to unsettle the trade to a large extent, more especially as the proceedings in the matter are shrouded with much mystery, and many rumors and conjectures are current. The idea prevails in some quarters that the projected combine is likely to go through, while others in the trade do not regard it very seriously. In either case there is a disposition on the part of both jobber and consumer to hold off until something definite is known about the matter. The retail trade in this quarter was rather dull, as is usual in the last and first days of a month, but jobbers report a fair run of small orders. Severe weather has also hindered the business to a considerable extent during the past week. Jobbers' quotations show no appreciable change. Small lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are quoted about as follows, but these rates are not uniformly maintained: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3 50; do., 95 lbs, $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates remain quiet and prices are largely nominal.

Sheet Iron.—Some good sized orders for Black and Galvanized Sheets for nearby and early future delivery are reported to have been placed with the mills, dealers and consumers being evidently apprehensive of higher prices. Makers, however, prefer in most cases not to book for extended deliveries, as lower prices are thought to be almost impossible, while changes in the other direction are encouraging. In some few cases good sized orders have been booked at a satisfactory advance for deliveries covering the first half of the year. The local jobbing demand is of fair volume, though prices at which retail sales were made were almost invariably low. Small lots from stock are quoted at about 2.35c. to 2.40c. for No. 27 Common Black Sheets, and 75 and 10 and 5 per cent. to 80 per cent. off the list for Galvanized Sheets.

Chicago advices are as follows: A good demand is still in progress for both Black and Galvanized Sheets. Some manufacturers of both are so well sold up they are practically out of the market. Inquiries are still being received for extended deliveries from largest buyers. Heavy Sheets are perhaps not quite so firm as Light Sheets, but mill shipments of No. 27 Black, standard brands, are strongly held. Small lots of Black Sheets from stock are quoted at 2.30c. to 2.40c. and Galvanized at 80 and 2½ per cent. off.

Old Metals.—The market is decidedly firmer, with an improved demand for Scrap Copper and Brass in car lots at an advance of about ¼c. per lb. The demand for export is better and there is an active inquiry from both home and foreign buyers. Scrap Iron is also generally strong, with a larger demand in some lines. Holders' ideas are still above those of consumers, however, and this tends to restrict the volume of business effected. Dealers in this city and vicinity are paying about the following rates for moderate sized lots, delivered here.

Heavy Copper	per lb. 9¼c.
Light and Tinned Copper	per lb. 8¾c.
Heavy Brass	per lb. 6 c.
Light Brass	per lb. 5 c.
Lead	per lb. 3¼c.
Tea Lead	per lb. 3 c
Zinc	per lb. 2½c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.

Wrought Scrap Iron, per gross ton.....	$10.50
Heavy Cast Scrap, per gross ton	9.25
Stove Plate Scrap, per gross ton.....	5.25
Burnt Iron, per gross ton.....	5.00
Tin Plate Scrap, per ton.....	3.75

THE IRON MARKET.

So far as Pig Iron is concerned, the markets in the leading distributing centers continue in a nervous condition, created by the doubt whether consumption can cope with the current heavy output. The sanguine have been punished so severely and so frequently during the past few years that very few have the courage of their convictions. Nor is the season of the year favorable to the development of a buoyant feeling. Nothing would carry more weight than a falling off in the make, but that is not likely to come at an early date, while the belief is quite general that approaching spring will considerably increase the requirements. A very large tonnage, in the aggregate, of Charcoal Iron has been placed at very low prices.

In Steel Billets the situation is clouded to some extent by the determined efforts of powerful interests to get the market into shape for large purchases for delivery during the second quarter of the year.

The demand for Finished Material is very satisfactory in some branches.

In the Wire trade the leading manufacturers have got together and have decreed a moderate increase in prices. The great consolidation is reported as progressing favorably. The auditors have completed their work, and their reports now go to England for review by a firm of accountants there.

Pig Iron.—Quite a fair amount of sales of moderate lots have been made in the New York district at close prices and there has been some business in New England. An order for 1500 tons for a New England concern went to an Alabama producer, while the sale is also reported for 1898 delivery of 7000 tons of Virginia Iron to a Connecticut plant. There is some inquiry for export. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $10.75 to $11.25; No. 2 Plain, $10.50 to $10.75. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.75; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

No improvement can be noted in the Philadelphia Pig Iron trade. A great deal of Pig Iron is being consumed, but new orders are comparatively scarce, and as prices have been weak and irregular for some time past there is nothing in the situation to encourage buying, except to cover requirements in the immediate future. If, however, the underlying conditions are as favorable as they seem to be, it will not be long before prices begin to stiffen. Meanwhile general quotations for seaboard delivery are about as follows, with the usual rebate of freight differences at points south or west: No. 1 X Foundry, $12 to $12.25; No. 2 X Foundry, $10.75 to $11.25; No. 2 Plain, $10.50 to $10.60.

The Chicago Pig Iron producers report their sales still keeping up to shipments. A number of good contracts were placed during the week, and further inquiries are in the market. The Southern sales agents have done very well, and it is claimed that all the weak sellers who recently disturbed quotations to some extent have now changed their views and are occupying a firmer position. The sales reported have all been made at full prices. We quote for cash as follows :

Lake Superior Charcoal.....	$11.50 to $13.00
Local Coke Foundry, No 1.....	11.50 to 12.00
Local Coke Foundry, No. 2.....	11.00 to 11.50
Local Coke Foundry, No. 3.....	10.50 to 10.75
Local Scotch, No. 1.....	11.50 to 12.25
Ohio Strong Softeners, No. 1.....	12.00 to 12.25
Southern Silvery.....	11.25 to 11.50
Southern Coke, No. 1.....	11.00 to 11.25
Southern Coke, No. 2.	10.35 to 10.60
Southern Coke. No. 3.....	10.10 to 10.30
Southern, No. 1 Soft.....	10.85 to 11.00
Southern, No. 2 Soft.....	10.35 to 10.60

In the Pittsburgh district the consumption of Bessemer Pig Iron by Steel interests is very heavy, and recent large purchases made are insufficient to take the present heavy output, with the result that a good deal of Iron is being piled. The present condition of the Pig Iron market strongly indicates that production will have to be restricted before much improvement can be expected. Foundry Irons are dull. We quote, f.o.b. Pittsburgh: No. 1 Foundry, $10.40 to $10.50 ; No. 2 Foundry, $9.90 to $10 ; Bessemer, $9.75 to $9.90, the lower price being for prompt Iron.

The market for Pig Iron in the Cincinnati district in a general way continues satisfactory. The consumption of Iron is holding up, and the amount of inquiry justifies the expectation that it will continue. Nearly all of the larger buyers, who are now inquiring, are doing so in a cautious and indirect manner, giving the idea that they are still parring for further concessions. While it is believed that the larger furnaces, especially in the Birmingham district, are not shading the quotations given in this issue, yet it is intimated that some "outside" smaller concerns are granting concessions even on this basis. The situation in Northern Irons remains unchanged. Quotations are as follows, f.o b. Cincinnati :

Southern Coke, No. 1.....	$9.75 to .....
Southern Coke, No. 2.....	9.25 to .....
Southern Coke, No. 3.....	8.75 to $9.00
Southern Coke, No. 1 Soft.....	9.50 to .....
Southern Coke, No. 2 Soft.....	9.25 to .....
Southern Coke, Gray Forge.....	8.75 to .....
Southern Coke, Mottled.....	8.50 to .....
Ohio Silvery, No. 1.....	12.75 to 13.00
Ohio Silvery, No. 2.....	12.00 to 12.25
Lake Superior Coke, No. 1.....	11.00 to 11.50
Lake Superior Coke, No. 2.....	10.50 to 11.00
Tennessee Charcoal, No. 1.....	13.00 to 13.25
Tennessee Charcoal, No. 2	11.50 to 12.00

The movement in Pig Iron in St. Louis is confined to moderate quantities for immediate delivery. Prices are fairly well maintained, although there are some furnaces who are evidently anxious for business and are making prices accordingly. Active buying is expected to take place soon, and prices will doubtless stiffen somewhat. The production of Pig Iron continues to be enormous, but the general feeling is that consumption will continue to increase so that no surplus stocks will be on hand to tend to depress prices. We quote as follows for cash, f.o.b. cars St. Louis :

Southern, No. 1 Foundry.....	$10.25 to $10.75
Southern, No. 2 Foundry	10.00 to 10.25
Southern, No. 3 Foundry.....	9.75 to 10.00
No. 1 Soft.....	10.00 to 10.25
No. 2 Soft.....	9.75 to 10.00

CHICAGO REPORT.

Scrap.—Business is much better. Cast Scrap is still very scarce. Old Metals are quite active, especially Copper. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap.....	$7.00	....
Machinery Cast.....	7.50	....
Malleable Cast.....	6 50	....
Stove Plate (free of burnt).....	5.50	....
Burnt Iron and Grate Bars.....	3.75	....
Sheet Iron and Hoops.....	3.00	....
Plow Steel and Breaking Stock.....	5.00	....
No. 2, such as Shovels, Hoes, &c...	2.50	....
Old Boilers—whole (Iron).....	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes.....	5.50	....
Cast Borings.....	3.00	....
Turnings.....	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy.....	....	9½c.
Copper Bottoms.....	....	8¾c.
Copper Clips.....	....	9¼c.
Red Brass.....	....	8 c.
Yellow Brass.....	....	6¾c.
Light Brass.....	....	4½c.
Pipe Lead.....	....	3.10c.
Tea Lead....	....	3 c.
Zinc.....	....	3 c.
Rubber.	....	4 c.
Inside Bicycle Tubing.....	....	10 c.
Outside Tubing.....	....	3½c.
Rubber Hose.....	....	1 c.

Anthracite.—The demand has improved materially, owing to the severity of the weather. The ruling prices of carload lots of 12 tons minimum are as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill.....	$5.00	$5.25
Milwaukee, Wis.....	5.00	5.25
Kansas City, Mo.....	7.00	7.25
Council Bluffs, Iowa.....	7.00	7.25
Lincoln, Neb.....	7.15	7.40
Sioux City, Iowa.....	7.50	7.75
Aberdeen, S. Dak.....	8.25	8.50
Dubuque, Iowa.....	6.30	6.65
Madison, Wis.....	6.50	6.75
St. Paul, Minn.....	7.50	7.75
Burlington, Iowa.....	6.50	6.75
Des Moines, Iowa.....	7.00	7.25
Davenport, Iowa.....	6.30	6.65
St. Joseph, Mo.....	7.00	7.25
Leavenworth, Kan.	7.00	7.25
Omaha, Neb.....	7.00	7 25

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver.....	$6.50
Pueblo	6.50
Colorado Springs.....	6.50
Leadville.....	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

The Edwards Sad Iron Company of Camden, N. J., have been incorporated, with a capital stock of $100,000. The company will manufacture implements of metal. The corporators are Thomas Cross Edwards, Joseph L. Harbinson, Harry L. Day and George M. Thomson of Philadelphia, and James Finley of Camden, N. J.

THE HARDWARE TRADE.

With most of the jobbing houses and manufacturers the past month has been on the whole fairly satisfactory, comparing well with the Januarys of preceding years. Many houses report a decided improvement in it over the corresponding month of 1897. Merchants are buying carefully, but their orders are better assorted than they have been and indicate a disposition to stock up somewhat more completely. At the same time the conservatism which has become habitual is evident. There is, however, a better undertone of feeling, and the fact that there is in many sections more money in the hands of the agricultural classes and more work for laborers is having its influence in promoting general prosperity and encouraging enterprise. The most active movement at the present time is in heavy goods, which lie near the raw material, but both jobbers and manufacturers report that Shelf Hardware, Tools, &c., are being called for in fair quantities. Orders as a rule are well assorted, covering many lines and indicating moderate and in some cases low stocks in the hands of the trade. In the matter of prices few changes are to be chronicled. In some lines the desire to sell has caused a slight yielding in quotations, but in most the market is well sustained. A slightly improved condition is perceptible in Nails, Screws, Bolts, &c. The question of department stores and catalogue houses demands increased attention from the trade, as they interfere with both retail and wholesale merchants, making it to be a matter of much importance in some communities as to what course shall be adopted to meet their competition. Manufacturers also are concerned in the subject, as there is a disposition on the part of some merchants to use their influence to prevent manufacturers from selling these houses, whose methods are so disturbing to the regular trade. Most merchants, however, recognize that the matter of prime importance to them in the conduct of their business is to see that their own methods are correct, that unnecessary expenses are cut off, that everything reasonable is done to hold present customers, and that enterprising efforts are put forth to extend trade.

Advices from Chicago.—The demand for Shelf Hardware is rather better than during the middle of January, although the heavy snow in some sections of the Northwest is still exerting some influence in checking trade. City business has shown a decided improvement as compared with January of last year, the volume of such business being easily doubled. Jobbers report a good movement in staple articles, but the demand for Wire Nails is considerably less than it was during the opening months of last year. At that time, owing to very light stocks, trade was abnormally heavy. The demand now, however, is quite up to the average of ordinary years. Bolts, Nuts and small Rivets are stiffer. Rivets are particularly firmer, owing to the scarcity of Rivet Rods. The demand for Heavy Hardware has shown considerable improvement during the past week.

Advices from St. Louis.—The Hardware trade continues in the satisfactory condition last noted. Traveling men are sending in heavy orders and report the outlook more promising than it has been for several years. The seasonable weather at present prevailing has had an excellent effect on cold weather goods. Shovel makers continue in control of the market, although the entrance of the Avery Stamping Company as manufacturers of Shovels is regarded with much interest by the trade. Galvanized Iron and Black Sheets are quite active and in Tin Plate a heavy business is recorded. Mention was made in our last report of the increased demand for Builders' Hardware and Mechanics' Tools, and it is pleasing to note that this condition still exists. Retailers are commencing to take some interest in Plain Wire, Wire Nails and Barb Wire, and as indications point to a consummation of the proposed Wire combination the demand for this class of goods is sure to be heavy. Collections are excellent.

NOTES ON PRICES.

Wire Nails.—The Wire Nail market on the whole is in better condition than a week ago, so far as the matter of price is concerned. The mills generally are refusing to accept orders for delivery after March, but in some cases this is being done. The New York price for small lots from store is $1.70 to $1.75.

Advices from Chicago.—The Wire Nail manufacturers held a meeting at Pittsburgh on Monday for the purpose of correcting some irregularities in prices which had recently sprung up. Inquiries during the past week have been very good and sales have been fair. Jobbers report a better movement in small lots from stock and expect the demand now to steadily increase as spring approaches. They quote small lots from stock at $1.60, but an early advance is expected.

Advices from St. Louis.—The demand for Wire Nails is very good. Jobbers report a satisfactory trade at $1.65 to $1.70, base, for small lots from store.

Cut Nails.—The Cut Nail market is without special feature, the demand being moderate and prices steady. Small lots from store in New York are quoted at $1.30.

Advices from Chicago.—Only a light demand is being received for Cut Nails and prices are unchanged at $1.45 for small lots from stock.

Advices from St. Louis.—The demand for Cut Nails shows some slight improvement, although no corresponding improvement is noticeable in prices. Jobbers are asking $1.45, base, for small lots from store.

Barb Wire.—The indications point to a large business in Barb Wire, and during the past week a number of orders have been placed.

Advices from Chicago.—Manufacturers report a better trade with only light stocks in their warehouses. They are expecting a very heavy demand as the spring trade opens, which may probably result in some difficulty in securing prompt shipments. Jobbers quote small lots from stock at $1.60 for Painted and $1.90 for Galvanized, but these rates are not expected to continue so low with manufacturers maintaining a firm attitude.

Advices from St. Louis.—The movement in Barb Wire is increasing and mills report a heavy inquiry. Jobbers report a heavy trade, and for small lots from store quote $1.70 for Painted, and Galvanized at 30 cents per hundredweight advance.

Screws.—The Screw market is in a more satisfactory condition than for a long time. The manufacturers are referred to as working together harmoniously and maintaining prices with exceptional regularity.

Carriage Bolts, Machine Bolts, &c.—This line of goods is referred to as more regular than it has been since the dissolution of the association. While there has of late been some divergence in the quotations of some of the manufacturers, owing to animated competition, the present condition of things is regarded as much improved, some of the extreme discounts having recently been withdrawn.

Galvanized Iron Range Boilers.—The advance made last week in the price of Galvanized Iron Range Boilers amounted to 10 per cent., and not 5 per cent., as stated in this column of our previous issue. The following are the current retail discounts on these goods:

	Per cent.
Galvanized Iron Range Boilers to and including 52-gallon	75
" " " " above 52-gallon	65
" " " " Extra Heavy, to and including 52-gallon	70
Galvanized Iron Range Boilers, Extra Heavy, above 52-gallon	60

with 5 per cent. extra on standard 30, 35 and 40 gallon Boilers.

Soldering Coppers.—There is some weakness in the market for Soldering Coppers, in common with all manufactured Copper, owing to sharp competition. The current price for these goods at retail is 15 to 16 cents per pound net.

Glass.—The factories are still cutting Glass to fill orders, and it is not probable that they will accumulate an assortment of sizes and quality much under 60 days. The famine caused by the scarcity of Glass during the late fall and early winter has not yet been fully satisfied, so that the demand from factory is quite large. There is a tendency among buyers, however, to hold back orders in hope of lower prices later in the year. Local jobbers still complain of lack of trade. The recent storm and cold weather will probably have the effect of retarding early spring orders, which might otherwise have been placed in the near future. Under these conditions the market continues to show weakness, and although 85 and 5 per cent. is the nominal discount for less than carload lots for Atlantic Coast points, 85 and 10 per cent. discount is obtainable.

White Lead.—The market has remained in a quiet condition. Corroders are accepting the old list prices for Lead in Oil and for Dry Lead.

Linseed Oil.—The position of the market is quite as strong as it was at the date of last week's review. Raw material has averaged higher in price. Orders have been coming in very fairly, but apparently not to the extent that present conditions and prospects would warrant.

Spirits Turpentine—Buyers' operations have been on a smaller scale, yet quite good in total amount, and prices varied only slightly.

Old Rags, Paper, &c.—The market for Paper Stock has been fairly active, with prices showing little change,

but generally firm. Dealers are paying about the following rates for New York City delivery:

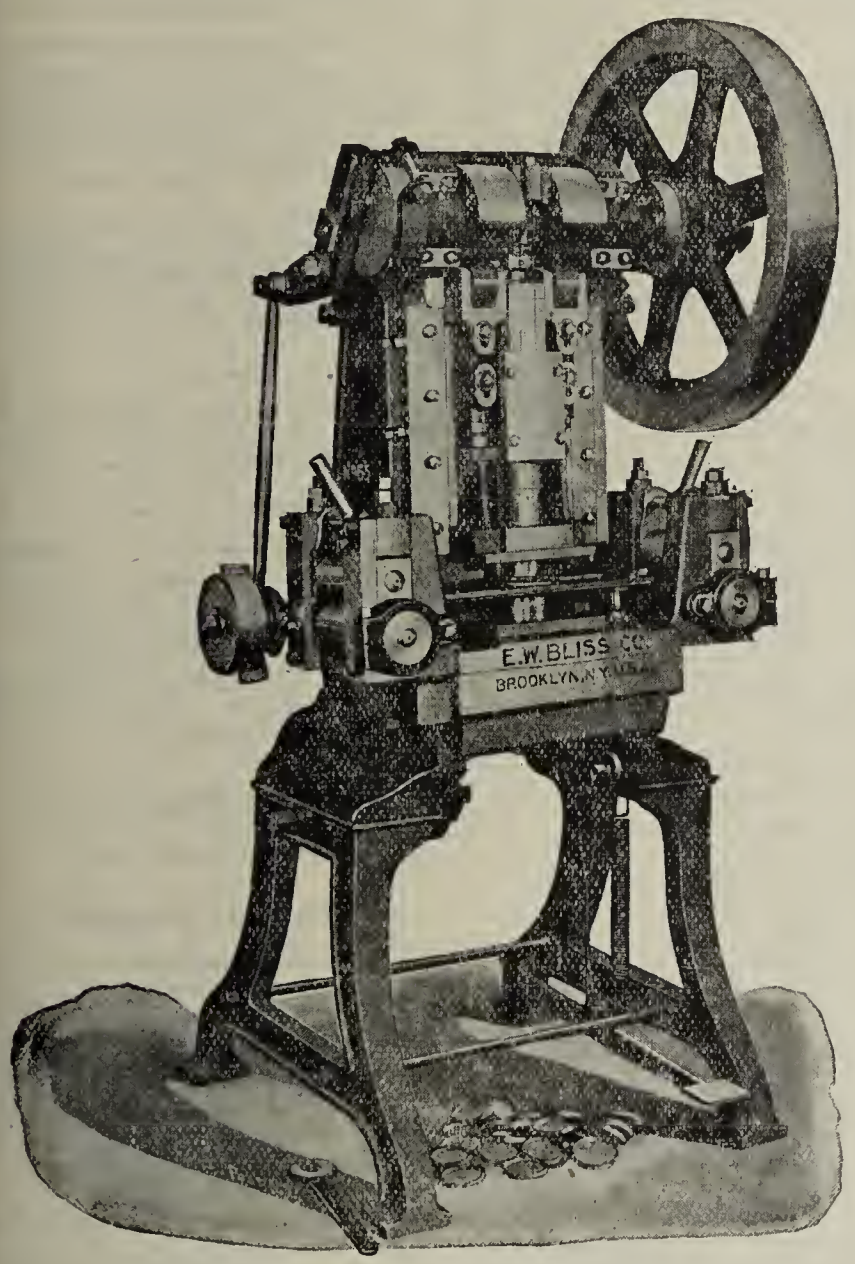
No. 1 White Rags	per lb.	2⅝ to 2¾c.
No. 2 White Rags	per lb.	1¾ to 1⅝c.
Mixed Rags	per lb.	1 c.
Blues and 3ds	per lb.	1 c.
Hard Sized White Shaving	per lb.	1¾ to 2 c.
No. 1 White Book Shavings	per lb.	1½c.
No. 2 White Book Shavings	per lb.	¾ to 1 c
Light Book Shavings	per lb.	½ to ¾c.
No. 1 Mixed Shavings	per lb.	¾ to ⅞c.
No. 2 Mixed Shavings	per lb.	½ to ⅝c.
No. 1 Printed Books	per lb.	⅞ to 1 c.
Ordinary Mixed Books	per lb.	½c.
Newspapers	per lb.	½ to 3/5c.
No. 1 Manila Paper	per lb.	⅝ to ¾c.
No. 2 Manila Paper	per lb.	⅜ to ½c.
Bogus Paper	per lb.	⅜c.
Common Paper	per lb.	¼ to 3/10c.
Straw Chips	per lb.	⅜c.
Binders' Clippings	per lb.	½c.
Jute Butts	per lb.	1⅛ to 1¼c.
No. 1 Jute Bagging	per lb.	¾ to 1 c.
Mixed Bagging	per lb.	½ to ¾c.
No. 2 Bagging	per lb.	½ to ¾c.
Hemp Twine	per lb.	1⅜ to 1¾c.
Manila Rope	per lb.	1¾ to 2 c.
Jute Rope	per lb.	1½ to 1¾c.
Mixed Rope	per lb.	¾ to ⅞c.

Old Rubber.—A fair demand is noted and prices show no quotable change. Local dealers are paying about the following figures :

Car Springs, ton lots, per lb	3½ c.
Rubber Shoes, carloads, delivered at factory, per lb	4¾ to 5 c.
Rubber Shoes, less than carloads, per lb.	4.70c.
White Wringer Rolls, per lb	4 c.
White Syringes, per lb	4 c.

Double Action Press with Double Roll Feed.

The E. W. Bliss Company, 16 Adams street, Brooklyn, N.Y.,are building a press for the rapid production of shells,



THE BLISS SHELL PRESS

which are cut and drawn from the strip in push through dies. From 60 to 150 may be drawn per minute, according to the size and style of shell. The roll feed is easily adjusted to different sizes of blanks. The feed pawls take their bite on toothless disks by means of a wedge action which permits of an easy adjustment and fine spacing. Both of the upper feeding rolls are provided with a cam lifting device permitting of opening the rolls at any time for stopping or readjusting the strip. The machine is especially designed for drawing paper covers, the strokes being 1⅛ inches (outer slide) and 4½ inches (inner slide) respectively. The bolster has an arrangement for steam heating. The press can be made with special stroke for metal shells, such as burners, ferrules, umbrella trimmings, thimbles, tin goods, &c. For general work it is made with the strokes of 2 inches outer and 4 inches inner slide. The other principal dimensions are as follows : Opening in bed, 6½ inches round ; opening in back, 10¼ inches wide ; distance back from center of slide, 6 inches ; largest blank that may be drawn, 10 inches ; largest punch, 6 inches ; adjustment of outer slide, 1½ inches ; size of balance wheel, 36 x 5¼ inches ; weight as shown, 2200 pounds. These measurements may be modified somewhat to suit special requirements.

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Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 3, 1898.

Tin—

Straits pigs.....15½@15¾¢

American Tin Plates—

American Base Box Quotations.

Based on 32,000 square inches in a box, which is exactly 2 per cent. more than in the English base box of 14 x 20 Tin Plates. The American base box weighs 110 ℔ and the English base box 108 ℔.

Highest Grade Charcoal—Bright.

Size.	Base.	Contents.	Per box.
10 x 14,	110-℔	...240 sheets	$5.65
"	140-℔	" "	7.25
12 x 12,	110-℔	" "	5.75
"	140-℔	" "	7.50
14 x 20,	110-℔	....120 "	5.65
"	140-℔	" "	7.25
"	160-℔	" "	8.85
"	180-℔	" "	10.45
"	200-℔	" "	13.15

20 x 28 double the price of 14 x 20.

12½x17,	140-℔	....120 sheets	5.35
"	180-℔	" "	6.95

Second Grade Charcoal—Bright.

10 x 14,	110-℔	....240 sheets	5.10
"	140-℔	" "	6.15
12 x 12,	110-℔	" "	5.25
"	140-℔	" "	6.30
14 x 20,	110-℔	....120 "	5.10
"	140-℔	" "	6.15
"	160-℔	" "	7.25

20 x 28 double the price of 14 x 20.

Highest Grade Coke—Bright.

10 x 20,	110-℔	....240 sheets	5.75
12 x 12,	110-℔	" "	4.15
"	140-℔	" "	4.95
14 x 20,	110-℔	....120 "	4.00
"	140-℔	" "	4.85

20 x 28 double the price of 14 x 20.

20x26½,	110-℔	....120 sheets	8.00
20x29½,	110-℔	" "	8.85
20x32½,	110-℔	" "	9.90
"	140-℔	" "	12.35
20x39½,	140-℔	" "	15.00

Old English Method Quotations

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$5.25
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	6 75
	IXX, 14 x 20	8.25
	IXXX, 14 x 20	9.75
	IXXXX, 14 x 20	11.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.50
Allaway Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	4.75
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$3.75
	IC, 10 x 20	5.50
	IC, 17 x 17	7.75
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.00
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	4.50
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔	15¢
95 ℔	20¢
90 ℔	25¢
85 ℔	30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	10.50@ 12.00
Worcester Grade, 12 to 14 lbs. coating	8.00@ 9.00
STP / L Grade, 10 to 12 lbs. coating	7.50@ 8.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00

	Per box of 56 sheets.
IX, 14 x 56	$12.50
IXX, 14 x 56	14.00
IX, 14 x 60	13.50
IXX, 14 x 60	15.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	2.00¢	2.40¢
17 to 20	2 10¢	2.50¢
21 to 24	2.20¢	2.60¢
25 and 26	2.30¢	2.70¢
27	2.40¢	2.80¢

Russia, Planished, &c. 100 ℔.

Patent Planished, ℔ ℔, A....$10.20 } 5%
Patent Planished, ℔ ℔, B..... 9.20 } dls.
Craig's Polished Sheet Steel.....8½¢
U.S. Polished Sheet Steel No. 27 A 5.05¢

Galvanized.

First quality.....dls. 80%

Copper—*Ingot.*

Lake..... 11¾@ 12 ¢
Casting Brands.....11½@ 11¾¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17¼c, Chicago, with extras according to size.

Copper, Bronze and Gliding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing, (100 ℔ lots). (To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.08
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots ℔ ℔, 40¢
100-℔ lots ℔ ℔, 36¢
No. 2 (guaranteed over 90% pure).
Small lots ℔ ℔, 34¢
100-℔ lots ℔ ℔, 33¢
Nickel Aluminum Casting Metal.
Small lots ℔ ℔, 39¢
100-℔ lots ℔ ℔, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots ℔ ℔, 35¢
100-℔ lots ℔ ℔ 30¢
Aluminum Rolled Rods, from ¼ to 1 inch diameter ℔ ℔, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter ℔ ℔, 55¢
Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 ℔ or more. Less quantities, 5¢ ℔ ℔ additional.

Wider than ....6-in.	14-in.	24-in.
And including....14-in.	16-in.	30-in.
	℔ ℔	℔ ℔	℔ ℔
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-℔ casks.....5¾¢
300-℔ casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&10%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....8
Galvanized Quarter Circle, O. G. and Box.....8

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 squar
Climax..... 2.20 squar
The Lloyd Spanish Tiling... 4.50 squar
W. J. Burton & Co.'s Roll Cap 3.00 squar
Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.3
Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 2
IC Tin. ℔ square,	$4.75	$4.50
Galv. ℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....℔ ℔ 2 ¢
" " Brown.....℔ ℔ 1½¢
" " Purple.....℔ ℔ 2½¢
" " Ground in oil, B. Red, ℔ ℔ 6½¢
" " Ground in oil, Red...℔ ℔ 6½¢
" " Ground in oil, Brown, ℔ ℔ 5½¢
" " Ground in oil, Purple, ℔ ℔ 6½¢
Linseed Oil, Boiled, in bbls.....44¢
Linseed Oil, Raw, in bbls.....42¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5½¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal..... .34¢
Spirits Turpentine, in bbls., ℔ gal....37¢
Asphaltum, Trinidad Refined, ℔ ton.$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet.....$1.25
Roofing Pitch, ℔ bbl of 300 ℔.....$3.00

NEW YORK, FEBRUARY 4.

The following quotations are for small lots:

luminum—

1 Aluminum (guaranteed over 99% ire), in ingots for remelting.
ll lots.....₩ ℔, 40¢
℔ lots.....₩ ℔, 36¢
minum Rods, from ¾-in. diam.
1 in. diam.....₩ ℔, 53¢
minum Sheet, B. & S. gauge.
In lots of 50 ℔s or more.

	6-in.	14-in.	24-in.
er than.....	14-in	24-in.	30-in.
luciuding.....	₩ ℔	₩ ℔.	₩ ℔.
13 to 19.....	$0.38	$0.40	$0.43
20.....	.40	.42	.45
21 to 23.....	.42	.44	.47
24.....	.42	.46	.49
25.....	.43	.47	.50
26.....	.43	.50	.55
27.....	.44	.53	.58
28.....	.44	.53	.60
29.....	.45	.56	.65
30.....	.46	.60	.73

te.—Lots of less than 50 ℔s 5¢ ₩ ℔ 'a.

ntimony—

kson.....₩ ℔, 8¾¢
lett's.....₩ ℔, 7½¢
anese.....₩ ℔, 7¼¢

rass—Planished.....net

ll and Sheet .....35% off

rass and Copper Tubes

Brazed Brass Tubing—

wn & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

n Round Tube.	Per ℔.
-in. up to 2-in.	$0.35
-in. up to ¾-in.	.36
-in. up to ⅞-in.	.38
-in. up to 1 in.	.41
16-in. up to 1⅛-in.	.48
-in. up to 5-16-in.	.65
16-in. up to ¼-in.	1.00
-in. up to 3-16-in.	1.50
naller than ⅛-in.	Special
n. and larger.	Special
n. to 3-in., to No. 19, inclusive.	.38

35% off.

pper & Bronze Tubing—

3¢ ₩ ℔ more than Brass.

onductors—

rrugated. *Round or Square.*—

anized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
.....70%

Spiral Riveted.

anized.....50%
ee also *Elbows and Shoes; Eave rough Miters; Strainers, Conductor.*

onductor Strainers—See *Strainers, Conductor.*

opper—

toms, Pits and Flats ₩ ℔ 18½@19¢ basis *Ingot.*
e.....12¼¢
onia Grade Casting.....11¼¢
nished.....net
et and Bolt.....15¢ ₩ ℔ basis

ubes—See *Seamless Brass Tubes.*

ave Troughs—

List Feb. 1, 1895.
or Slip Joint, Galvanized....80&10%
or Slip Joint, Terne.....65%

ave Trough Mitres—

or Slip Joint.....list, 25%

bows—Plain Adjustable—

.....70&10%
anized.....80%

Crimped Tubing.

inned or Galvanized.....35%

Stove Pipe--

falo Four-Piece.

	4½	5	5½	6	7-inch.
1.	$0.70	.77	.82	.87	1.05 per doz.
2.	.61	.66	.71	.74	....

lbows and Shoes—

Flat Crimp.

.....35%
anized.....35%

orrugated. *Flat Crimp.*

anized.....70&5%

Round or Square.

.....70&5%
anized.....70&5%

soline—See *Petroleum Products.*

ron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
. 10 to 16.....	₩ ℔, 2 00....	2.30¢
. 17 to 21.....	₩ ℔, 2.10....	2.40¢
. 22 to 24.....	₩ ℔, 2.20....	2.50¢
. 25 and 26...	₩ ℔, 2.30....	2.60¢
27.....	₩ ℔, 2.40....	2.70¢
28.....	₩ ℔, 2.50....	2 80¢
erican B. B.....	₩ ℔, 4¢	

Russia, Planished, &c.

uine Russia, accord- g to assortment.....₩ ℔, 10¼@10½¢
Stained.....6¢@10¢
ent Plauished ₩ ℔. A, 9¾¢; B, 8¾¢ net
g Polished Sheet Steel.....₩ ℔ 8½¢

Galvanized.

Nos. 10 to 16.....	₩ ℔, 12¢	75&10& 5% off.
Nos. 17 to 21.....	₩ ℔, 13¢	
Nos. 22 to 24.....	₩ ℔, 14¢	
Nos. 25 to 26.....	₩ ℔, 15¢	
No. 27.....	₩ ℔, 16¢	
No. 28.....	₩ ℔, 17¢	
No. 29.....	₩ ℔, 19¢	
No. 30.....	₩ ℔, 21¢	

36 in. 1¢ ₩ ℔ higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₩ ℔.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per ℔.....38¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 ℔..... 6 ¢
Lead. Amn. White, in oil..... 6 ¢
Lead. Red. bbls. aud ½ bbls..... 6 ¢
Lead, Red, kegs..... 6 ¢
Ochre, American..... 1½¢
Red Venetian, American..... 1¾¢
Linseed Oil:
Raw, ₩ gal.....45@46¢
Boiled.....47@48¢
Spirits Turpentine:
In bbls.....36¢
In cases.....44¢
Putty:
In barrels and ½ bbls..... ...1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 ℔ casks.

Fancy Lagos.....₩ ℔ 5 ¢
Clarified.....₩ ℔ 4⅞¢
Accra.....₩ ℔ 4¾¢
Half Jack.....₩ ℔ 4½¢
Cecilia.....₩ 100 ℔ $4.85
Choice Red.....₩ 100 ℔ 4.60

(*Spot Oil, ½c. ₩ ℔ higher.*)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline..... ₩ gal. 10@11¢
Kerosene..... ₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral-

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nippies.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897..... 40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons..... ..75%
Galvanized Iron Range Boilers above 52 gallon.....65%
N. B.—5 % extra on Standard 30, 35 and 40 gal. Boilers.
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized.....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized 50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.

Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock. ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ ℔.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₩ bbl. $1.47@$1.48
Rosin, E. & F.....₩ bbl. 1.52@ 1.60
Rosin, G. & H.....₩ bbl. 1.65@ 1.70
Rosin, I. & K.....₩ bbl. 1.80@ 1.90
Rosin, M. & N.....₩ bbl. 2.10@ 2.45

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.

Pennsylvania:

Best Bangor, ₩ sqr. .....$3.50@$4.50
No. 1 Bangor Ribbon..... 3.00@ 3.25
Pen Argyle, ₩ sqr..... 3.25@ 3.50
Peach Bottom, ₩ sqr..... 4.75@ 5.60
No. 1 Chapman, ₩ sqr.... 3.00@ 4.25
Lehigh Slates, ₩ sqr .. .. 3.25@ 3.80

Vermont:

Sea Green, ₩ sqr.....$2.45@$3.05
Purple, ₩ sqr..... 3.75@ 4.00
Variegated Purple..... 2.25@ 2.90
Unfading Green, ₩ sqr... 3.50@ 4.00
Red, ₩ sqr..... 8.50@10.50

Solder and Soldering Fluids— Solder—

½&½ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.

Per gal.....60¢

Concentrated Soldering Flux.

f o.b. New York.

In barrels. ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.

No charge for package.

Bbls. about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs about 55 ℔, ₩ ℔.....4¢

5% dis.

Yager's Soldering Salts.

½ ℔ bottles, each.....30¢
Large quantities, ₩ ℔.....40¢

Soldering Coppers—

Per ℔.....15¢@16¢ net

Spelter—

Western Spelter..... 4.40@4½¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ ℔.....15½¢
Straits, pigs, ℔ ℔..... 14½¢
Straits, in bars, ₩ ℔.....15½¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Caliand or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20	5.75
" "	IXXX,	14 x 20	6.50
" "	IXXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 ℔.....10¢
95 ℔.....15¢
90 ℔.....20¢
85 ℔.....25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 ℔ coating...	$11.50 @ 13.00
Redipped, or Good Old Style. 20 to 30 ℔ coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 ℔ coating.....	8.00 @ 9.25
STP / L Grade, 10 to 12 ℔ coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ ℔.

Charcoal Plates, Bright—

Melyn and Caland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke, IC, 14 x 20..... $4.25
IX, 14 x 20..... 5.25

Terne Plates—

Worcester Grade, IC, 14 x 20.....	4.25
20 x 28.....	8.50
Dean Grade. IC, 14 x 20.....	4.00
20 x 28.....	8.00
Gilbertson's Old Method. IC, 14 x 20..	7.50
20 x 28..	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 189 .

1¼ and less, Plain .... 57&10%
1¼ and less, Galv. .... 50&10%
1½ and larger, Plain..... 57&10%
1½ and larger, Galv..... .... 55&10%
Screw and Socket Joint Casing.....65%
Inserted Joint Casing.....60%
Boiler Tubes, 2¼ inch and smaller.72½%
2½ inch and larger 75%

Zinc—

600 ℔ casks ₩ ℔ 5¾¢ | Per ℔.....6¼¢

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Illinois Pure Aluminum Co., Lemont, Ill.

Architectural Ornaments.
Art Metal Relief Co., Covington, Ky.
Frand, Martin J. & Co., Camden, N. J
Friedley & Voshardt, Chicago, Ill.

Accountants.
Wilkinson, Geo., Chicago, Ill.

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Kieckhefer Bros. Co., Milwaukee, Wis.

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Peck Bros. & Co., New Haven, Conn.
Wilson, R. M., Rome, N. Y.

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I. X. L. Beer Pump Co., Phila., Pa.

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Wolff, L. Mfg. Co., Chicago, Ill.

Bronze and Bronzing Liquid.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

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Bliss, E. W. Co., Brooklyn, N. Y.
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Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brookiyn, N. Y.

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Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

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Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co. Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
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Northrop, H. S., 40 Cherry St., N. Y.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

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Crawford & Young, Boston, Mass.

Cocks, Ball, Basin and Stop.
Landers, Frary & Clark, New Britain, Conn.
Peck, Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

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Art Metal Relief Co., Covington, Ky.
Berger Bros. Co., Philadelphia, Pa.
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Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
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Universal Machine Co., Canton, Ohio.

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Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

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Garry Iron & Steel Roofing Co., Cleveland, O.
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Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs. Rain Water,
Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, Ohio.

Dampers.
Berger Bros. Co., Phila., Pa.
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Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
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Universal Machine Co., Canton, Ohio.

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Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

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Troy Nickel Works, Troy, N. Y.

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Connors, William, Troy, N. Y.

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Carton Furnace Co., Utica, N. Y.
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Hart & Crouse Co., Utica, N. Y.
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Keen & Hagerty Mfg. Co., Baltimore, Md.

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Kent, C. M. Mfg. Co., Baltimore, Md.

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Whelan, Dennis, J., Troy, N. Y.

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Palmer, I. E., Middletown, Ct.

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Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

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Munsell, Eugene & Co., 218 Water St., New York.

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Millar, C. & Son, Utica, N. Y.

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Highton, Wm. & Sons, Boston, Mass.
Schreiber & Conchar Mfg. Co., Du buque, Iowa.

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Atlanta Steel & Tin Plate Co., Atlant Ind.

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Gummey, McFarland & Co., Phila., Pa
Holton Iron Roofing Co., New Lisbon, O
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Salem Nail Co., 292 Pearl St., N.Y.

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Peck, Stow & Wilcox Co., 27 Murra St., N. Y.

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Double Truss Cornice Brake Co., Buf falo, N. Y.
Ferracute Machine Co., Bridgeton, N.J
Keene, Geo. C. & Co., Cincinnati, O.

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ıner & Peck Mfg. Co., New Haven, Conn.
agara Stamping & Tool Co., Buffalo, N. Y.
il. Geo. A. & Co., Newark, N. J.
ck, Stow & Wilcox Co., 27 Murray St., New York.
obinson, J. M. & Co., Cincinnati, O.
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iles & Parker Press Co. Brooklyn, N. Y.
niversal Machine Co., Canton, Ohio.
est Mfg. Co., Buffalo, N. Y.
helan, Dennis J., Troy, N Y.

eet Metal Work.

rt Metal Relief Co., Covington, Ky.

eets, Iron and Steel.

pollo Iron & Steel Co., Pittsburgh, Pa.
tna-Standard Iron & Steel Co., Bridgeport, O.
uce & Cook, 186 to 190 Water St., N. Y.
ncinnati Corrugating Co., Piqua, O.
e, Jas. A. & Co., Newark, N. J.
llansbee Bros. Co., Pittsburgh, Pa.
mmey, McFarland & Co., Phila., Pa.
on, Conklin & Co., Baltimore, Md.
Cullough Iron Co., Wilmington, Del.
rton Tin Plate Co., Cambridge, O.
born, J. M. & L. A., Cleveland, O.
public Iron Works, Pittsburgh, Pa.
. Louis Stamping Co., St. Louis, Mo.
ylor, N. & G. Co., Philadelphia, Pa.
ood, W. D. Co., McKeesport, Pa.
ood Co., Alan, Philadelphia, Pa.

eets, Galvanized.

tna-Standard Iron & Steel Co., Bridgeport, O.
pollo Iron & Steel Co., Pittsburgh, Pa.
uce & Cook, 186 to 190 Water St., N. Y.
an Corrugating Co., Piqua, Ohio.
Clure & Co., Pittsburgh, Pa.
Cullough Iron Co., Wilmington, Del.
public Iron Works, Pittsburgh, Pa.
ylor, N. & G. Co., Philadelphia, Pa.
ood Alan Co., Philadelphia, Pa.

ngles and Tiles, Metallic.

rden, W. J. & Co., Detroit, Mich.
ncinnati Stamping Co., Cincinnati, O.
rtright Metal Roofing Co., Philadelphia, Pa.
n City Mfg. Co., Pittsburgh, Pa.
urer Bros. Co., Brooklyn, N. Y.
ntross Metal Shingle Co., Camden, N. J.

t.

lwell Lead Co., 63 Centre St., N. Y.

ing. (*See Roofing and Siding.*)

te Dresser.

rks, F. R., Ashland, O.

ters' Tools.

lt, Jno. & Sons, 253 Broadway, N. Y.
em Nail Co., 292 Pearl St., N. Y.

Slitting Shears.

Whelan, Dennis J., Troy, N. Y.

Snow Guards.

Halliday, M., East 9th St., N. Y.

Solder.

Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.

Hull, M. L., Cleveland, O.

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Ostrander, W. R. & Co., 204 Fulton St., N. Y.

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Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove Patterns.

Cincinnati Pattern Works, Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros. Co., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.

Parks & Parks, Troy, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.

Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stoves and Ranges.

Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Champion Steel Range Co., Cleveland, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
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Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Sheppard, Isaac A. & Co., Phila., Pa.
Weir Stove Co., Taunton, Mass.
White-Warner Co., Taunton, Mass.

Stoves and Ranges, Gas.

Clark, Geo. M. & Co., Chicago, Ill.
Griswold Mfg. Co., Erie, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Clark, Geo. M. & Co., Chicago, Ill.
Cleveland Foundry Co., Cleveland, O.
Dangler Stove & Mfg. Co, Cleveland, O.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.

Tea Kettles.

Hill-Whitney Aluminum Co., Boston, Mass.
Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

Tinners' Tools, Machines and Supplies.

Berger, L. D., Philadelphia, Pa.
Berger Bros. Co., Phila., Pa
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co, 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.

Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate. (*Mfrs. of.*)

Ætna-Standard Iron & Steel Co., Bridgeport, O
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Berger, L. D., Philadelphia, Pa.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Ellwood Tin Plate Co, Ellwood City, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.

Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.

Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Valves.

Eastwood Wire Mfg. Co., Belleville, N. J.
Goodrich, Judson A. Co., 120 Beekman St., N. Y.
Jenkins Bros., 71 John St., New York.

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Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
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Washers, Valves, &c.

Marston, I. G. & Co., Boston, Mass.

Water Closets.

Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.
Wolff, L. Mfg. Co., Chicago, Ill.

Water Heaters.

Kemp, C. M. Mfg. Co., Baltimore, Md.
Ruud Mfg. Co., Allegheny, Pa.

Wind Gates.

Miner & Peck Mfg. Co., New Haven, Ct.

Wiping Cloths.

Porsch, John, Erie, Pa.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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An experienced TINNER, PLUMBER and ENERAL JOBBER; state wages. John H. Newbury, Bay Shore, L. I., N. Y. Feb. 5

A good TIN ROOFER who can do furnace vork, general tinsmithing and take charge of hop; must be a good mechanic and hustler; a good job for the right man. "Tin Roofer," ffice of *The Metal Worker*, 232-238 William treet, New York City. Feb. 5

TRAVELING SALESMAN to sell full line of teel roofing, eave trough, conductor pipe and everal specialties; must have some experience nd good references. Henry Smith, 22-24 Pickering Building, Cincinnati, Ohio Feb. 5

EXPERT PLATER who understands nickel, opper, brass and special electroplating in ntique finishes, &c.; state age, experience, &c. Metal," care E. S. Adams, 312 The Cuyahoga, leveland, Ohio. Feb. 5

First-class STOVE PATTERN FITTER; tate experience, age, &c. "Metal," care E. S. dams, 312 The Cuyahoga, Cleveland, Ohio. Feb. 5

A FOREMAN and CUTTER for cornice and obbing shop; must be up on all requirements; good situation to the right man. M. M. Whyte & Bro., 304 Thirteenth street, N. W., Washington, D. C. Feb. 5

A young man who understands something bout the cornice business to drum up work art of the time; a good position can be develped by the right man. "F. J. T.," office of *The letal Worker*, 232-238 William street, New York ity. Feb. 5

A first-class TIN and HEAVY SHEET IRON VORKER who understands plumbing, steam tting and hot water heating, and who can ake estimates on that kind of work; a good lace at good wages for a man who is a hustler nd has ability; must be sober and reliable, and eady to come at once. Lock Box 174, Everett, Vash. Feb. 5

SALESMEN everywhere to sell on commision a newly patented article used by roofers. V. R. Pratt, Shenandoah, Pa. Feb. 5

An experienced RETINNER; state quantity f tin used on staple lines and wages wanted. 'Retinner," office of *The Metal Worker*, 232-238 Villiam street, New York City. Feb. 5

One good all around SHEET METAL VORKER; a man who can do blower pipe ork and outside cornice work; must be married and sober; good shop, good work, good ages, steady job. 68 West Main street, Lexington, Ky. Feb. 5

Strictly A1 PLUMBER for country shop; ust be strictly sober and first-class clean, mooth worker on new and jobbing work; one who understands steam and hot water preerred; state age and wages wanted. "W. & S.," ffice of *The Metal Worker*, 232-238 Willam street, lew York City. Jan. 29

A young man with some experience in inside nd outside tin work; must be honest, and ages reasonable. Otto J. Baertict, Troy, Ind. Jan. 29

A good all around workman at PLUMBING, INNING and HEATING; one accustomed to obbing; must be of sober and steady habits; ood appearance; steady work; state wages nd reference. "Plumber," General Delivery. 'aterson, N. J. Jan. 29

An experienced FOREMAN for metal ceiling epartment; must be posted as to makng dies nd operating drop presses; state experience nd wages expected. Lock Box 472, Canton, hio. Jan. 29

A man, young and energetic, as FOREMAN in furnace shop. John F. Foster Company, 6 'ortland street, Boston, Mass. Jan. 29

SALESMAN who has had experience in selling ranges and furnaces to building trade to represent company about to open branch in New York City; highest references required. "Western No. 129," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 29

SITUATIONS WANTED.

An experienced tin plate works CLERK seeks a position with a good company; may take an interest in the business. "X.," office of *The Metal Worker*, 509-510 Hamilton Building, Pittsburgh, Pa. Feb. 5

By a TINSMITH understanding roofing and furnace work. L. Baron, 75 Henry street, New York City. Feb. 5

By a first-class BUFFER; good work on all kinds of metals and bicycles; union shop pref-rred. Otto Dietrick, 7 Comes street, Newark, N. J. Feb. 5

By a PLUMBER in a small town; will work for salary or percentage. W. J. Leo, 142 South Morgan street, Chicago, Ill. Feb. 5

By a first-class TINNER; good on assortment, shop, pump work and general jobbing. "Real Good," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

By a young man with three years' experience in tinning, furnaces and iron piping; strictly sober, and can furnish first-class reference from present employer. Box 140, Mt. Morris, N. Y. Feb. 5

As ASSISTANT HEATING ENGINEER, or would accept position as traveling salesman; can lay out and construct work; A1 references. Box 208, Mt. Morris, N. Y. Feb. 5

In factory as SUPERINTENDENT or MASTER MECHANIC; thoroughly posted on all modern methods in manufacturing patented and builders' hardware and special machinery; understands the business from the ground up with years of experience as foreman and superintendent; a practical man and a hustler at the bench. "Dies and Tools," care J. Cassidy, 1300 Wabash avenue, Chicago, Ill. Feb. 5

By an experienced TINWARE SALESMAN to represent manufacturers of stamped and pieced tinware, roofing and bright tin plate, sheet and galvanized iron in the State of Alabama on commission. "Tinware Salesman," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

As an A1 SHIPPING CLERK: have had ten years' experience in the steam, hot water and hot air business; can furnish seven years' reference from present employer. "Shipper," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

A man thoroughly understanding the manufacture of railroad signal lamps, cable and electric car headlights, wishes to change position; has had charge of manufacturing plant for a number of years; can handle men and machinery to best advantage; well posted on all modern methods of stamping, drawing and spinning; correspondence solicited with manufacturers or those contemplating the manufacture of this very profitable and steadily increasing line. "Headlight," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

Young man, 18 years of age, desires to finish his trade as a HOT WATER, STEAM and GAS FITTER; one year's experience; wages not so much of an objcct as a good place to learn; try me. Harry M. Hawley, Canaseraga, N. Y. Feb. 5

As SUPERINTENDENT or FOREMAN of foundry, by a man of experience in the construction of stoves, steel ranges, fire place furniture and jobbing work; competent in management of men; A1 references as to character and ability. "Foreman," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 5

By a young man, 24 years of age, with seven years' experience, as PLUMBER and TINSMITH; references; married. "Industrious," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

By a high grade NICKEL PLATER on stove work; all kinds of plating; also experienced on bicycle and sewing machine work; can do A1 white work economically. Thos. Anderson, General Delivery, Utica, N. Y. Feb. 5

With a plumbing supply house by a young man 25 years of age; three years in business; can furnish best of references and give bonds if nccessary; strictly temperate. "Supply," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

In a tin shop or hardware store, by a young man who has had over three years' experience at tinning, roofing, spouting, furnace work and plain plumbing; can furnish best of references. F. L. Archer, Copenhagen, N. Y. Feb. 5

By a first-class CORNICE MAKER. L. Slom, 71 Eldridge street, New York City. Feb. 5

By a first-class CORNICE and SKYLIGHT MAKER as foreman or to work at the bench; six years as foreman; 18 years at the trade; wages $3 per day. "F. C.," care H. Klein, 297 East Houston street, New York City. Feb. 5

By a first-class PLUMBER; city or country; understands steam and hot water heating; 15 ycars' experience; strictly sober; married; references if required. John Goodwin, plumber, Post Office, Pelham Manor, New York City. Feb. 5

By an experienced SOLICITOR and DRAFTSMAN in roofing and cornice business; accurate estimator, practical mechanic; successful with Boston architects and builders; satisfactory reasons for changing; references. "Energy," office of *The Metal Worker*, 33 Mason Building, Boston, Mass. Feb. 5

By a first class PLUMBER and GAS FITTER; years of experience practically and in business; sober and temperate; married, and can do roofing and leader work. "G. Plumber," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

By an all around man at cornice, furnace, roofing and general shop work; has managed the largest shop in Savannah, Ga. "Shop," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

By a first-class CORNICE CUTTER with a reliable firm; wages not so much of an object as a steady position where good work is appreciated. "Push," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 5

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As FOUNDRY FOREMAN, by a thorough, practical man who has filled position as such for many years in a satisfactory and profitable manner; reference. "Foundry Foreman," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

By a young man, as PLUMBER and GAS FITTER; 12 years' experience; can furnish five years' reference from last employer; sober and reliable; city or country. "F. P. S.," 128 Fifth street, Long Island City, N. Y. Feb. 5

SALESMAN with an established trade in Western New York, Northwestern Pennsylvania with hardware, tinware and stove trade; open for an engagement for 1898; satisfactory references. "J. D. W.," 221 Eighteenth street, Buffalo, N. Y. Jan. 29

As SALESMAN in heating and plumbing line; expert in steam, water or hot air; would go on the road or take charge of retail department in any city. "P. B.," office of *The Metal Worker*, 232-238 William street, New York City. Jan. 29

As TINNER, by a young man 20 years of age; six years' experience at inside and outside work; some experience at pipe fitting. Perry Shipman, Celina, Ohio. Jan. 29

A permanent position by TINNER, PLUMBER and HOT WATER FITTER; 12 years' experience on furnaces and all kinds of job work; Northern New York preferred; strictly temperate. Ed. Henry, Lowville, N. Y. Jan. 29

Good line of hardware or specialties on commission for Chicago. "W. S.," 245 Peoria street, Chicago, Ill. Jan. 29

By a TINNER; 14 years' experience at all branches of the trade; 38 years of age; sober; reference. "Tinsmith," care McAllister, Tuckerton, N. J. Jan. 29

A SALESMAN calling on the hardware trade would like to sell tin plate, galvanized eave trough, sheet iron, stove piping, &c., on a commission basis in North and South Carolina. "Tin Plate," Box 67, Winston, N. C. Jan. 29

By a young man 18 as first-class PLUMBER'S HELPER; three years' experience; would like steady position; city or country. M. Seaman, 69 Rivington street, New York City. Jan. 29

Steady position by a PLUMBER and STEAM FITTER; can do all kinds of roofing and tinning, figure and estimate from plans; first-class references; steady and reliable; Southern States preferred. Post Office Box 184, Putnam, Conn. Jan. 29

SALESMAN, with an established trade with the hardware, stove and house furnishing trade through all the Southern States including Texas, wants good side line; good commission. "Side Line," 519 Freemason street, Norfolk, Va. Jan. 29

By a good all around TINSMITH; 15 years' experience on furnace work, ventilating; inside and outside jobbing; temperate; single. E. Weirich, 90 Dewitt street, New Haven, Conn. Jan. 29

A HELPER for tinner or roofer with one and a half years' experience. Daniel Bank, 23 Prospect street, Boston, Mass. Jan. 29

Special Notices.

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These Patterns are developed on heavy detail paper, and will save their cost many times over.

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Hardware, Stove and Tinware Store, Tin Shop attached, doing good business, established twenty-five years. Central location in county seat. Will give satisfactory reason for wanting to sell. Will reduce stock to $2000. Address P. O. Box 204,
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2	No. 2 " " " each	10.00
3	30 in. Wright's Sheet Iron Folders "	7.00
4	30 in. Wood Bottom Sheet Iron Folders "	6.00
2	Flanders Circle Shears "	12.50
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1	lot 17 x 20 Bar Folders each $10.00 $12.00	$15.00

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—THE WRONG BABY.—Nearsightedness and absentmindedness caused a domestic tragedy in St. Louis the other day; that is, it was tragedy for a while. Mr. John Smith took another man's baby by mistake. He descended from his car at the wrong corner, and mechanically headed for the fourth house. On the steps was playing a little eighteen-months-old boy. Mr. Smith picked the little fellow up and walked in. He was about to hang his hat on the hall tree when he noticed there was none there. He looked around then, and saw he was in the wrong house. For a moment he hesitated, then beat a hasty retreat. But he didn't stop to look at the baby to see if that was his. He walked out of the yard and down the street, still carrying the baby.

When he reached his home he found his own child cooing on the floor of the hall. He looked at it for a moment, then went back into the kitchen where his wife was attending to supper.

"Hello, dear," he said to his wife, "whose kid is that in the hall?"

"Why, John," she said, and then she stopped, "Why whose baby have you got there?"

John started to say something, stopped, and looked at the yellow-haired infant in his arms. His own child has hair as black as an Indian's. John stared for a moment.

"Why, I don't know," he said.

His wife questioned him, but it availed nothing. He remembered he had taken it from some one's porch, but whose he did not know. His wife became excited. She asked him how he could possibly make such a mistake; she described the sufferings of the poor mother when she missed her child, and begged him to rack his brain and try to recollect where he picked it up. But his brain refused to be "racked," and his wife gave up at last in despair.

"Well, John," said she, "the only thing to do is to take it to the police station. The mother will be sure to go there."

So to the police station Mr. Smith took it, and in due time it was restored to its frantic mother.—*Exchange.*

—YEZ know Casey, the conthractor," said Mr. Dolan.

"Oi do," replied Rafferty.

"Is he what ye'd call reliable?"

"He is the most reliable man Oi iver knew. Whiniver he tells yez anythin' ye kin depind on its not bein' so."—*Washington Star.*

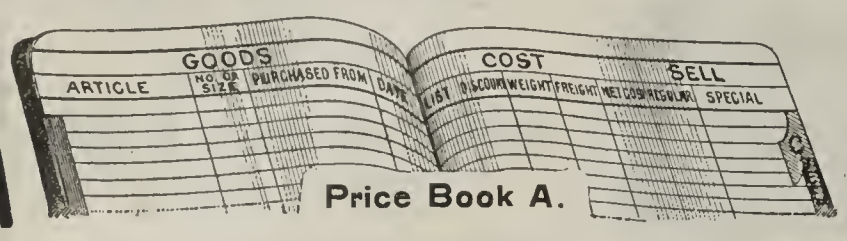
—A MAINE paper tells of a farmer in that State who hired two boys to help him cut his hay, and when the job was finished gave each of them a cent for the work they had performed, and then offered to harness his team and haul the boys home for a cent apiece.—*N. Y. Tribune.*

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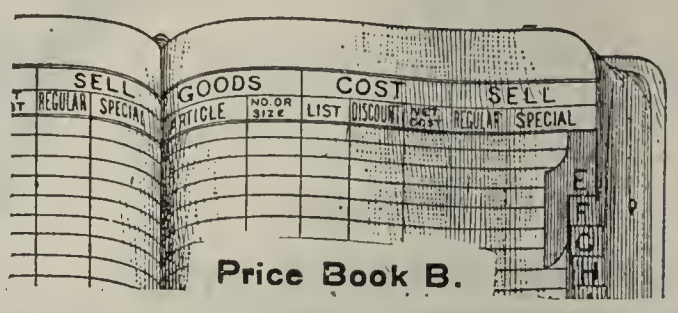
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Columns are provided for the name and number or size of goods, for noting from whom purchased, date of quotation or purchase, list and discount, and for entering freight expenses. Under the heading of selling prices, the regular and any special price or remarks in regard to the goods are given place. ***Size of page, 4 x 7 inches.***

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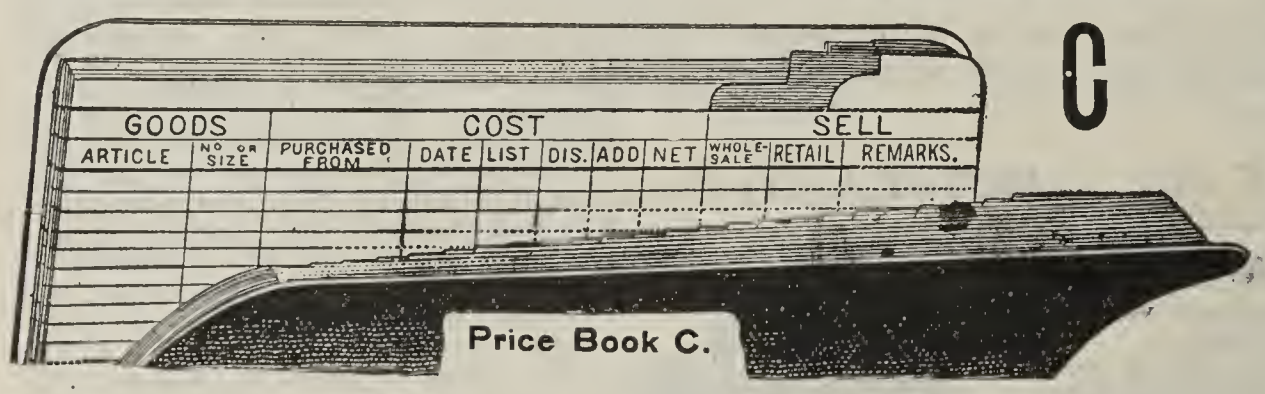
Price Book B.

In this book each page is complete in itself, and the record of prices does not, as in Book A, run across two pages Thus it accommodates a larger range of goods with much less detail in the record. By the use of familiar abbreviations is sufficiently large for the convenient and concise record of prices. ***Page, 4 x 7 inches.***

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Price Book C.

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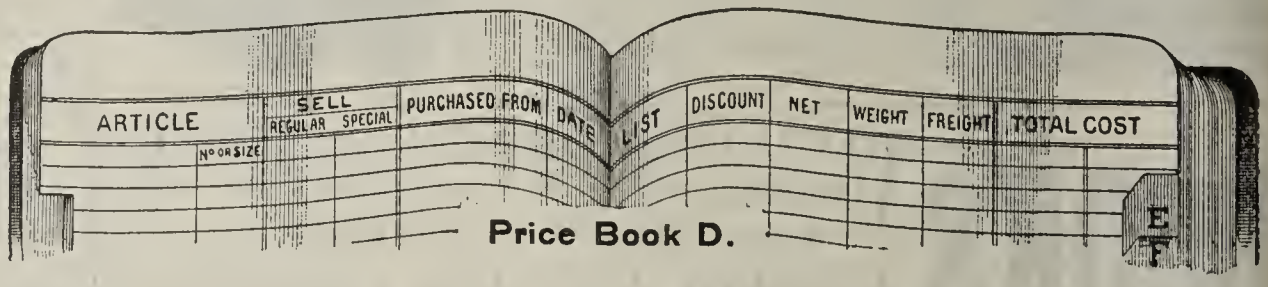
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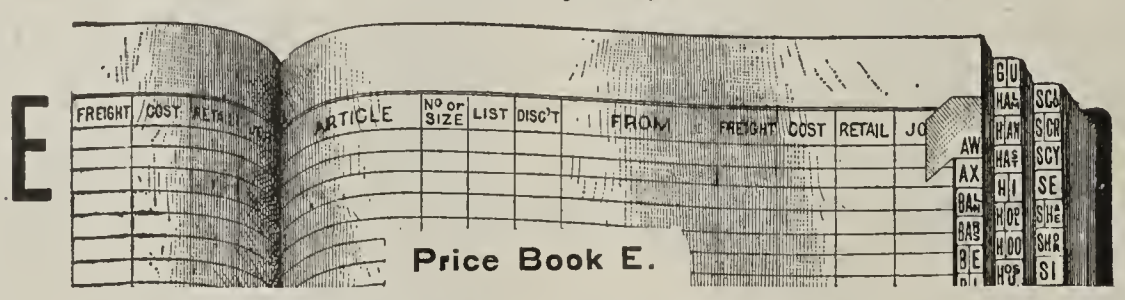
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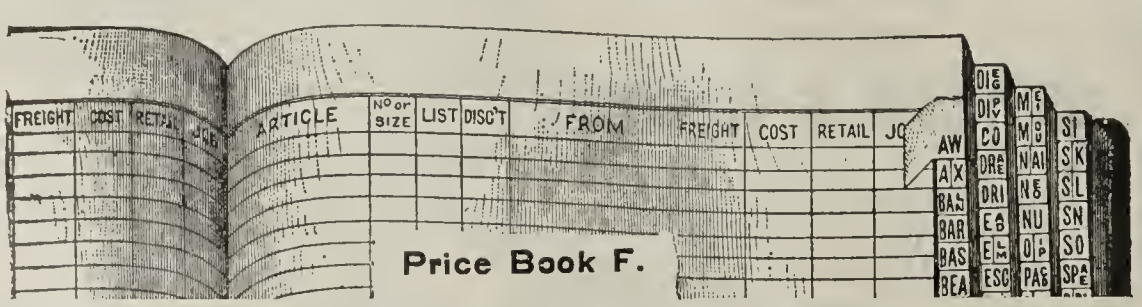
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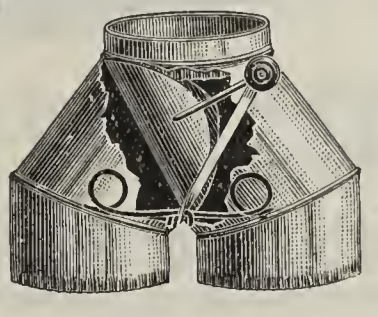
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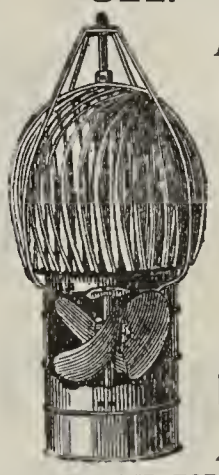


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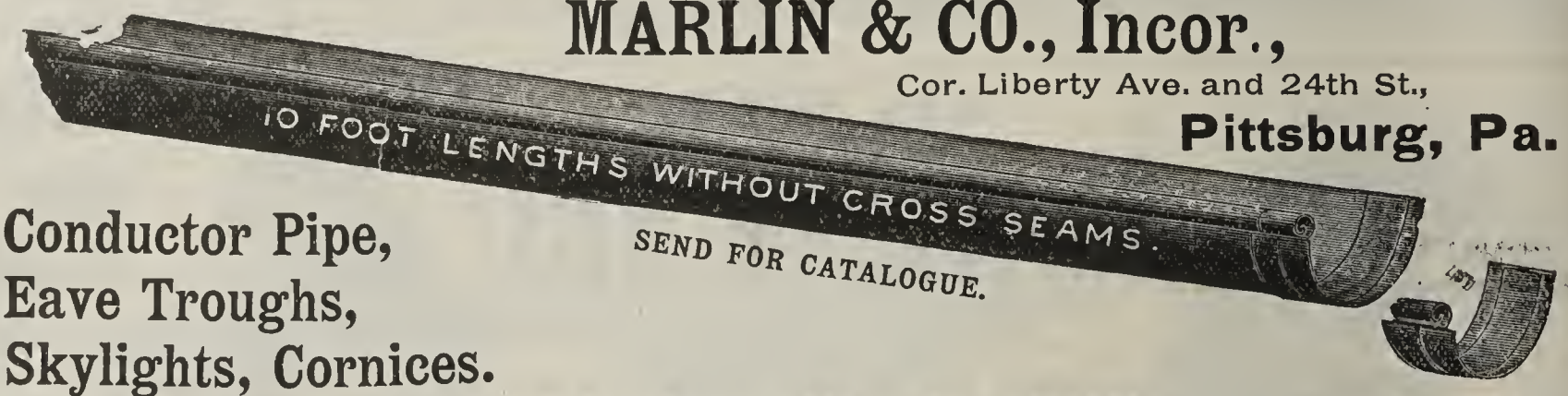
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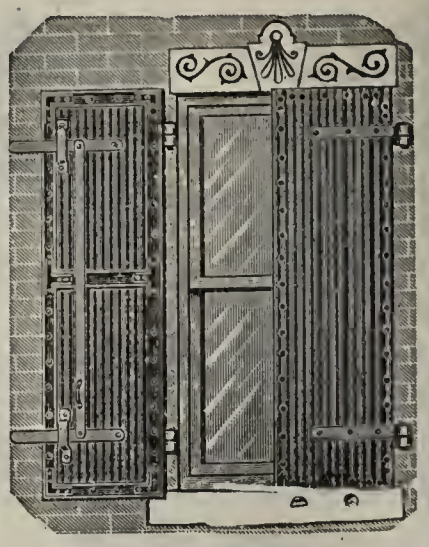
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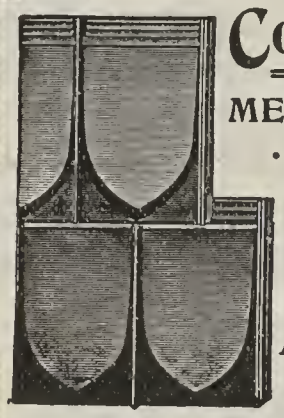
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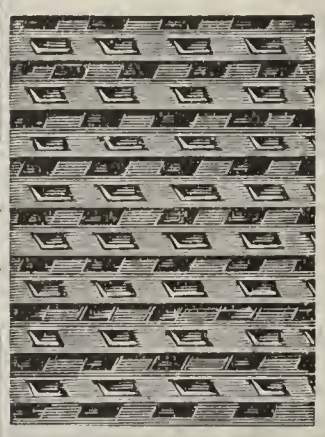
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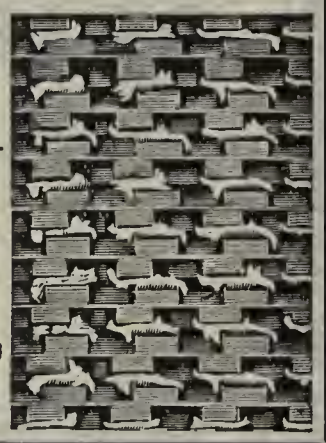
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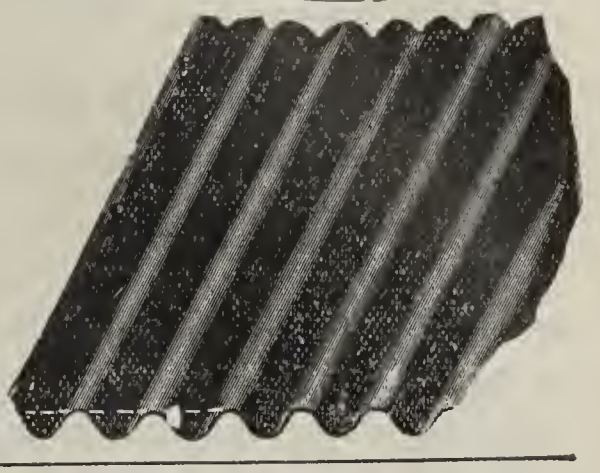
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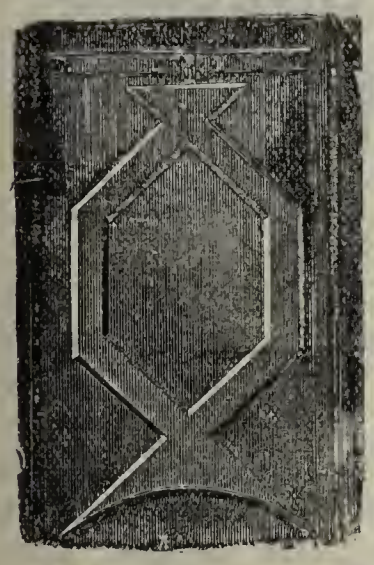
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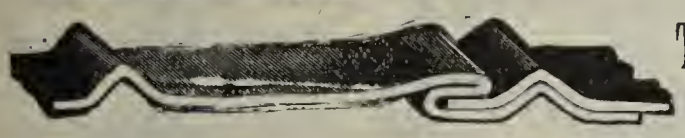
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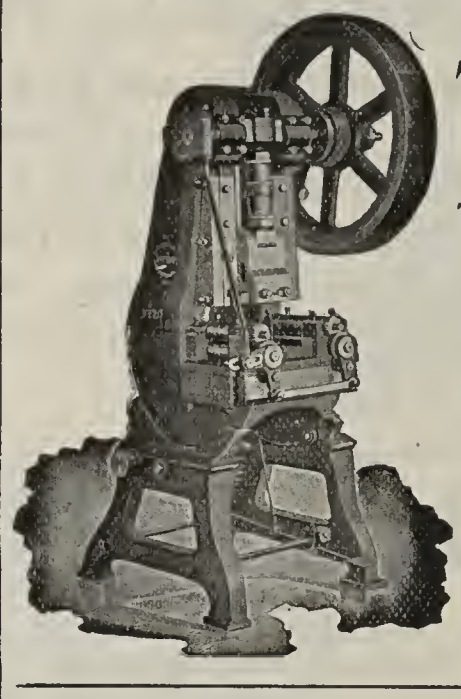
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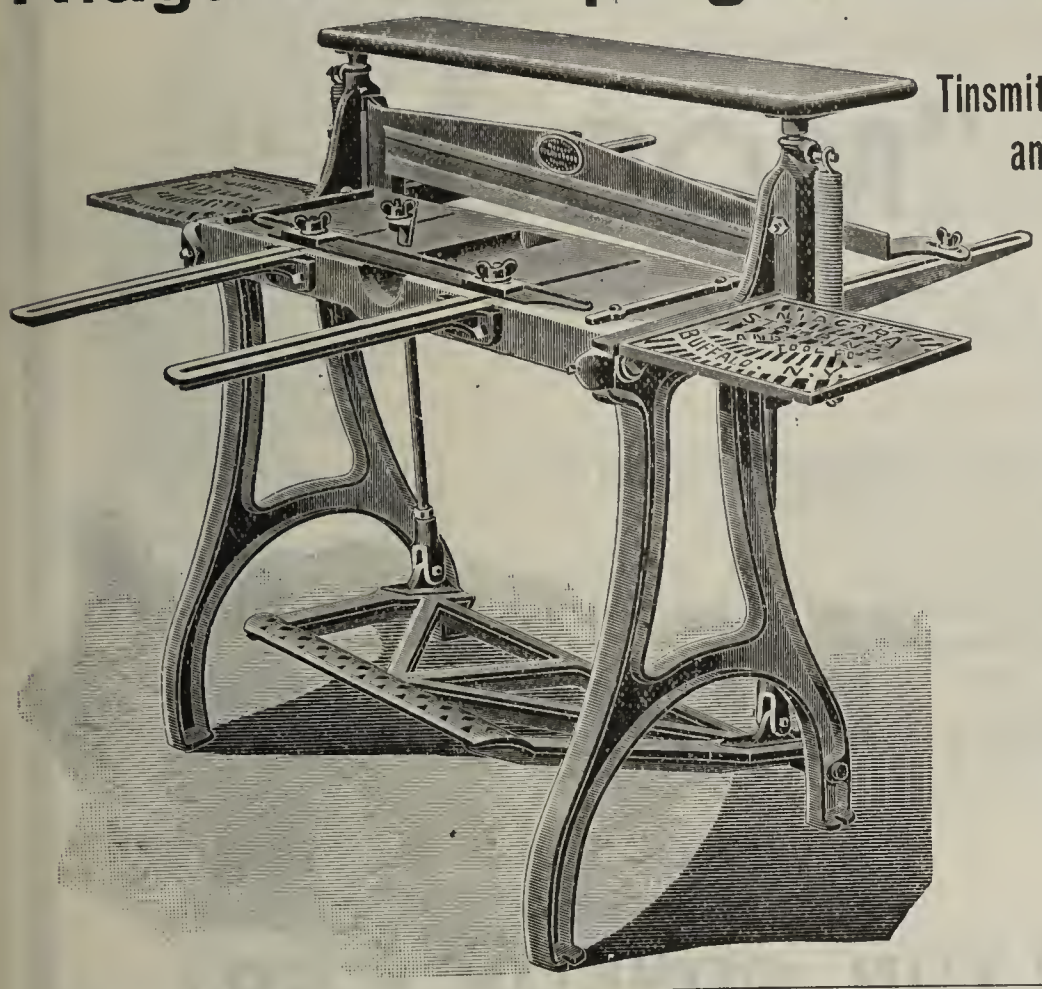
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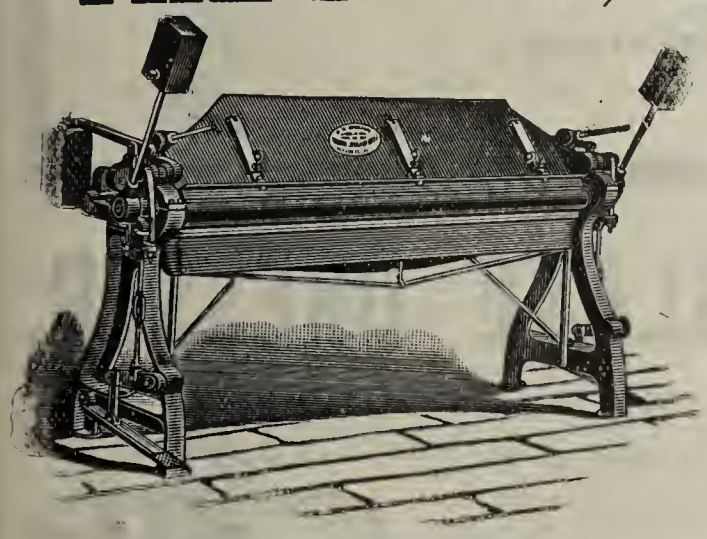
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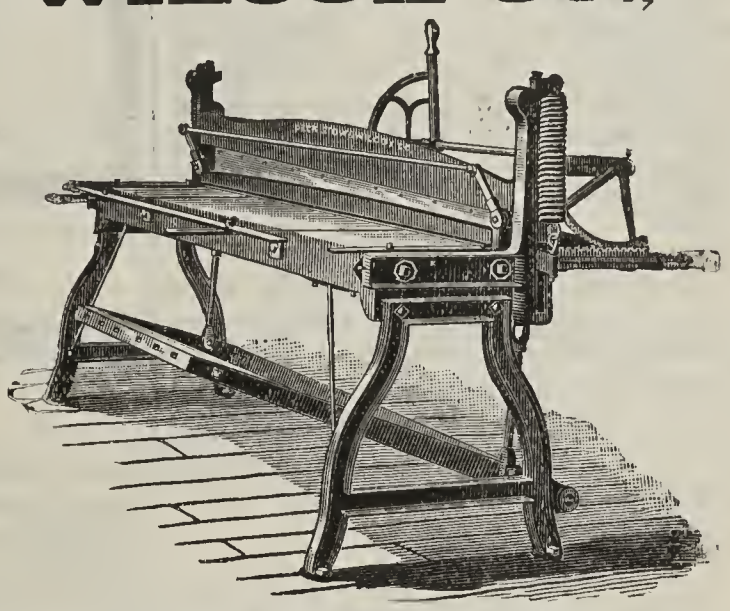
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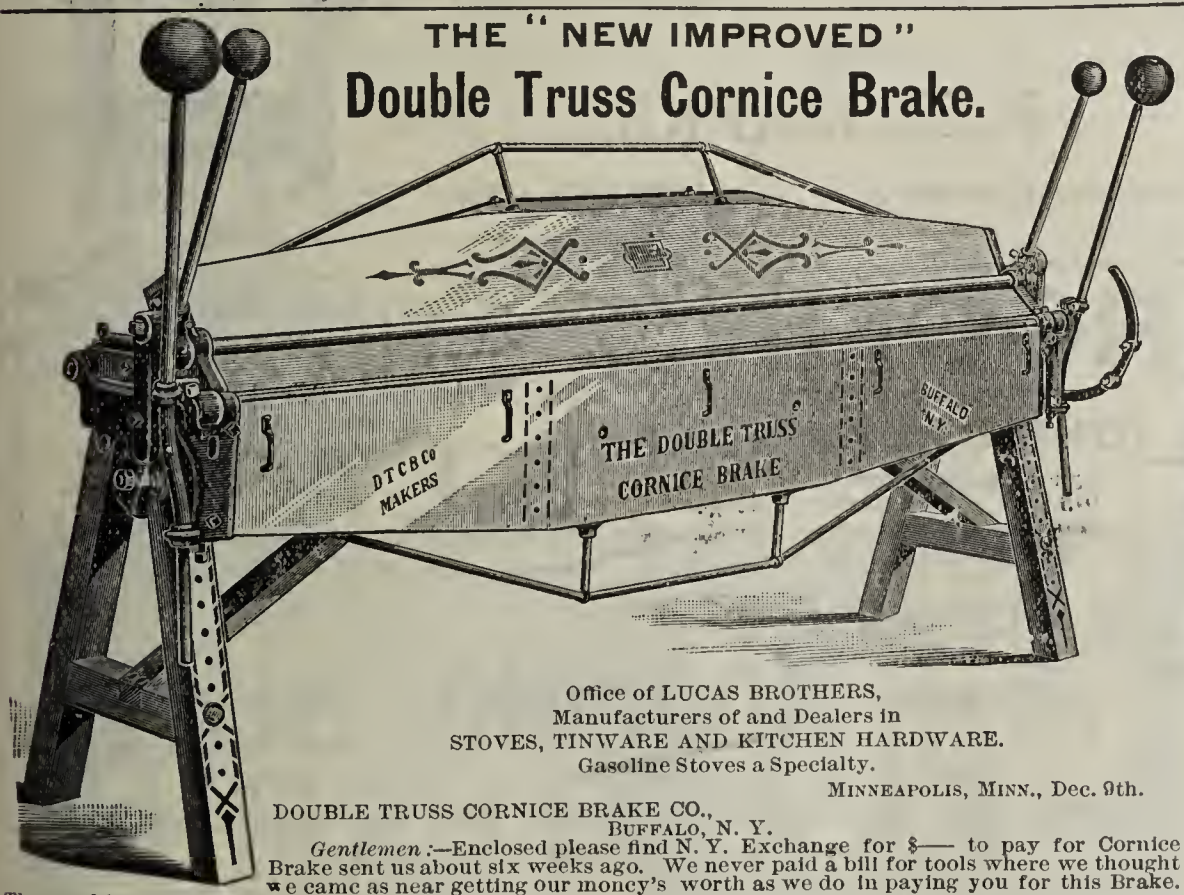
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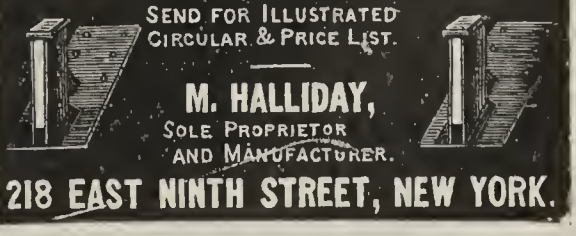
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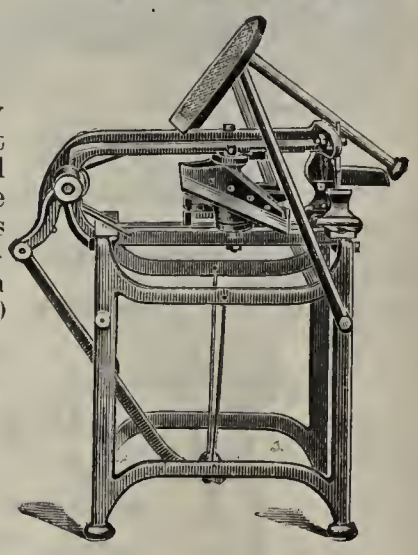
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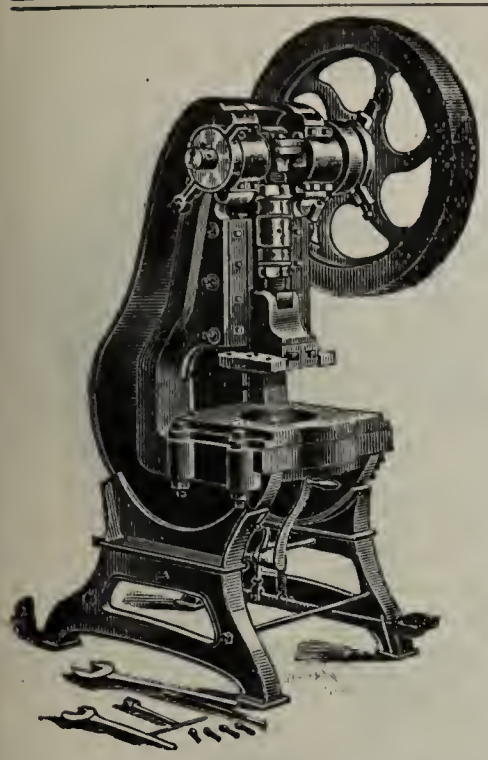
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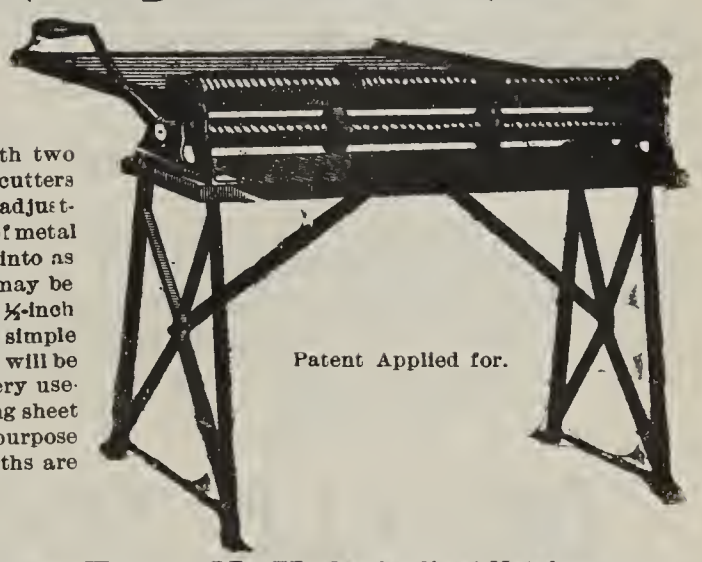
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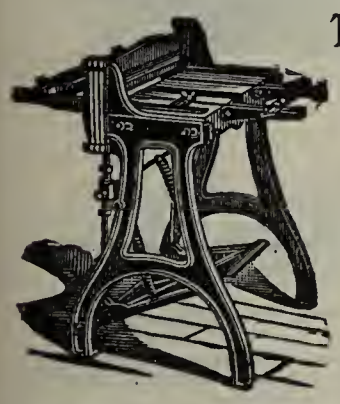
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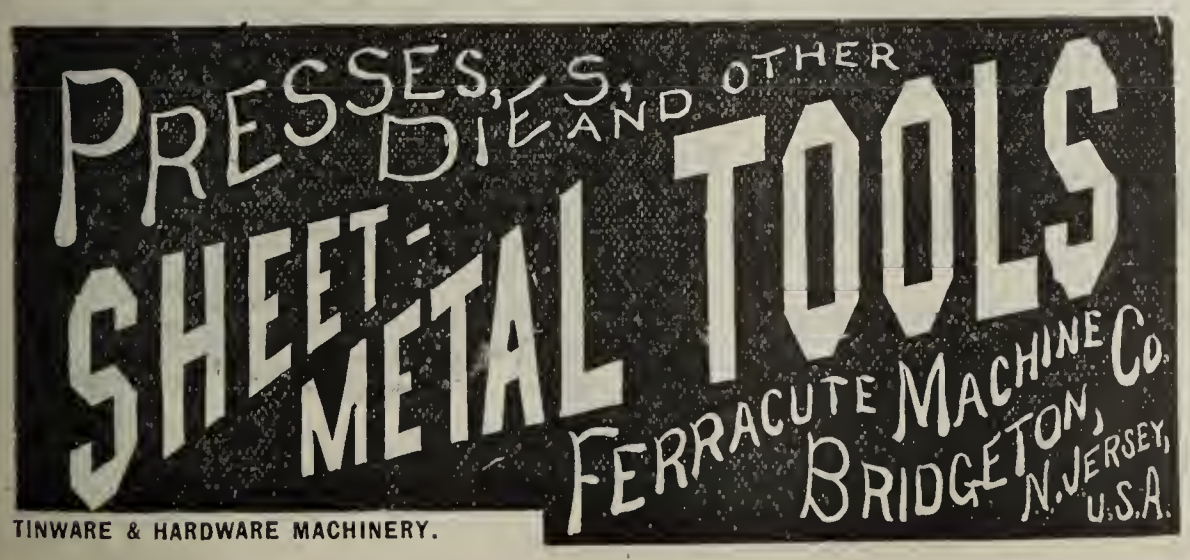


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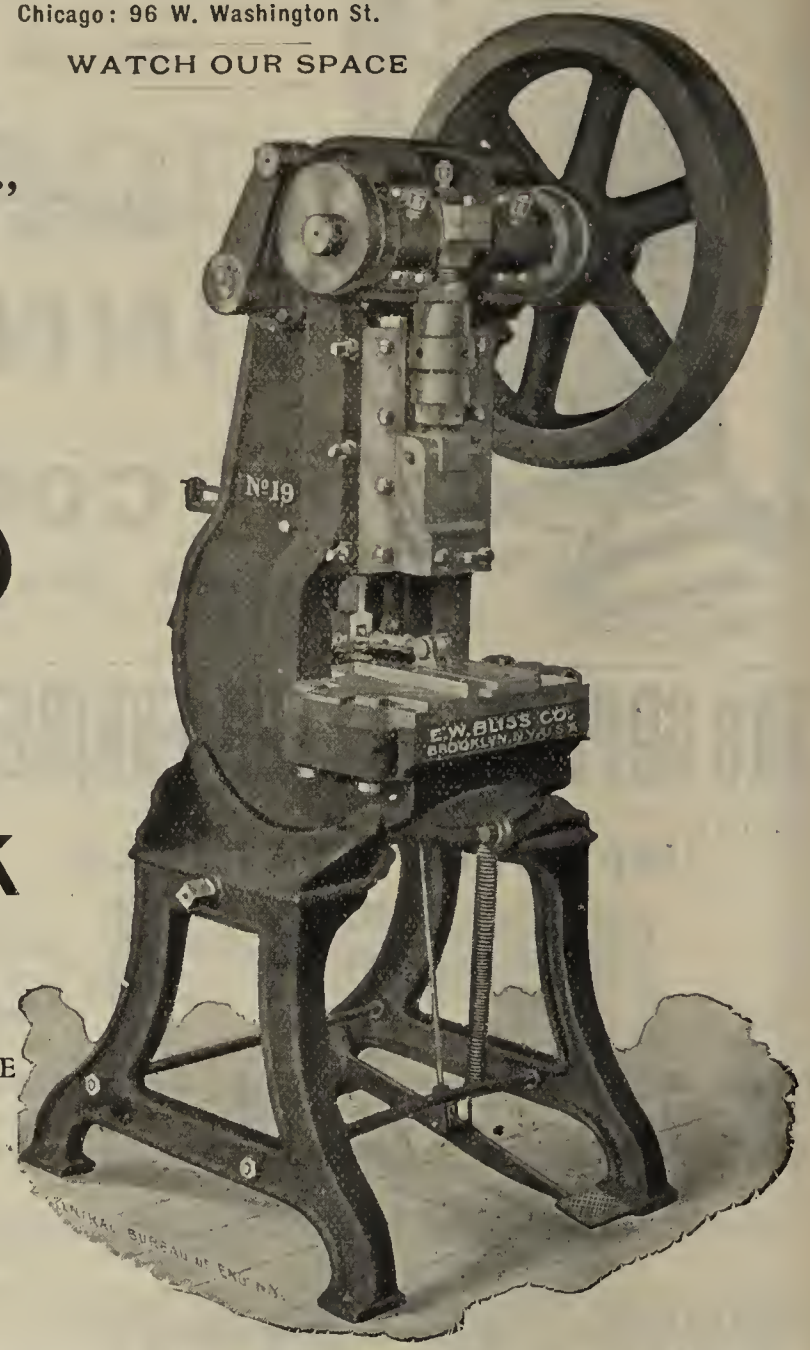
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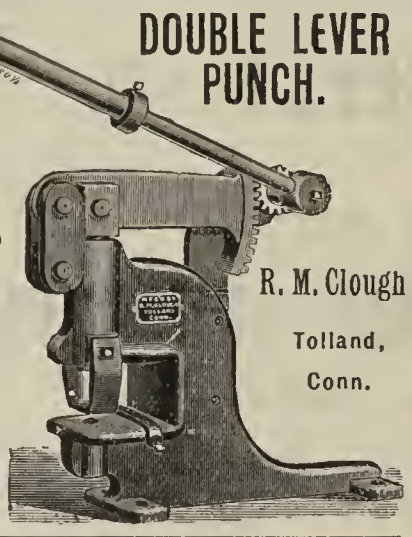
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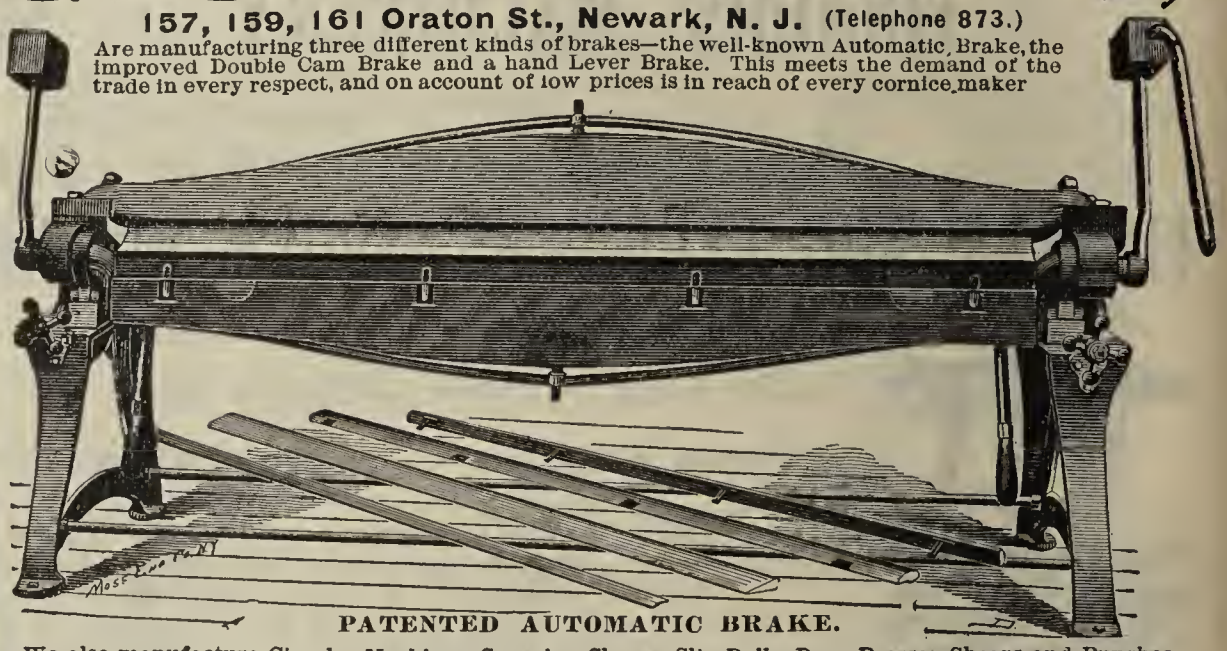
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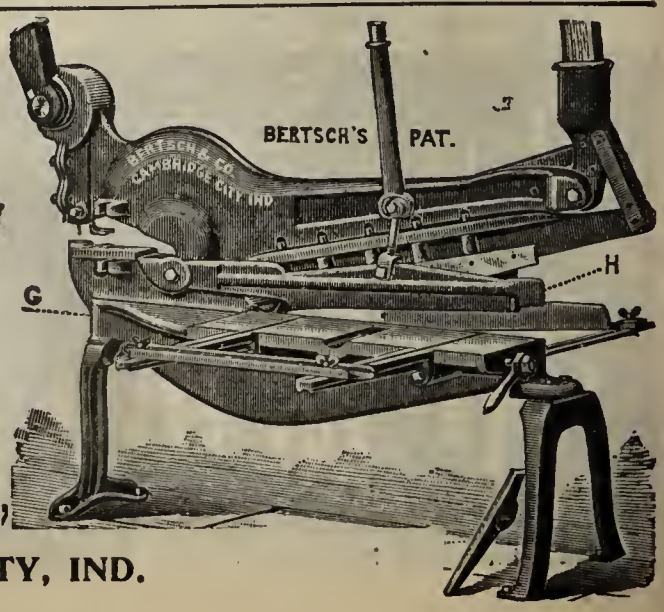
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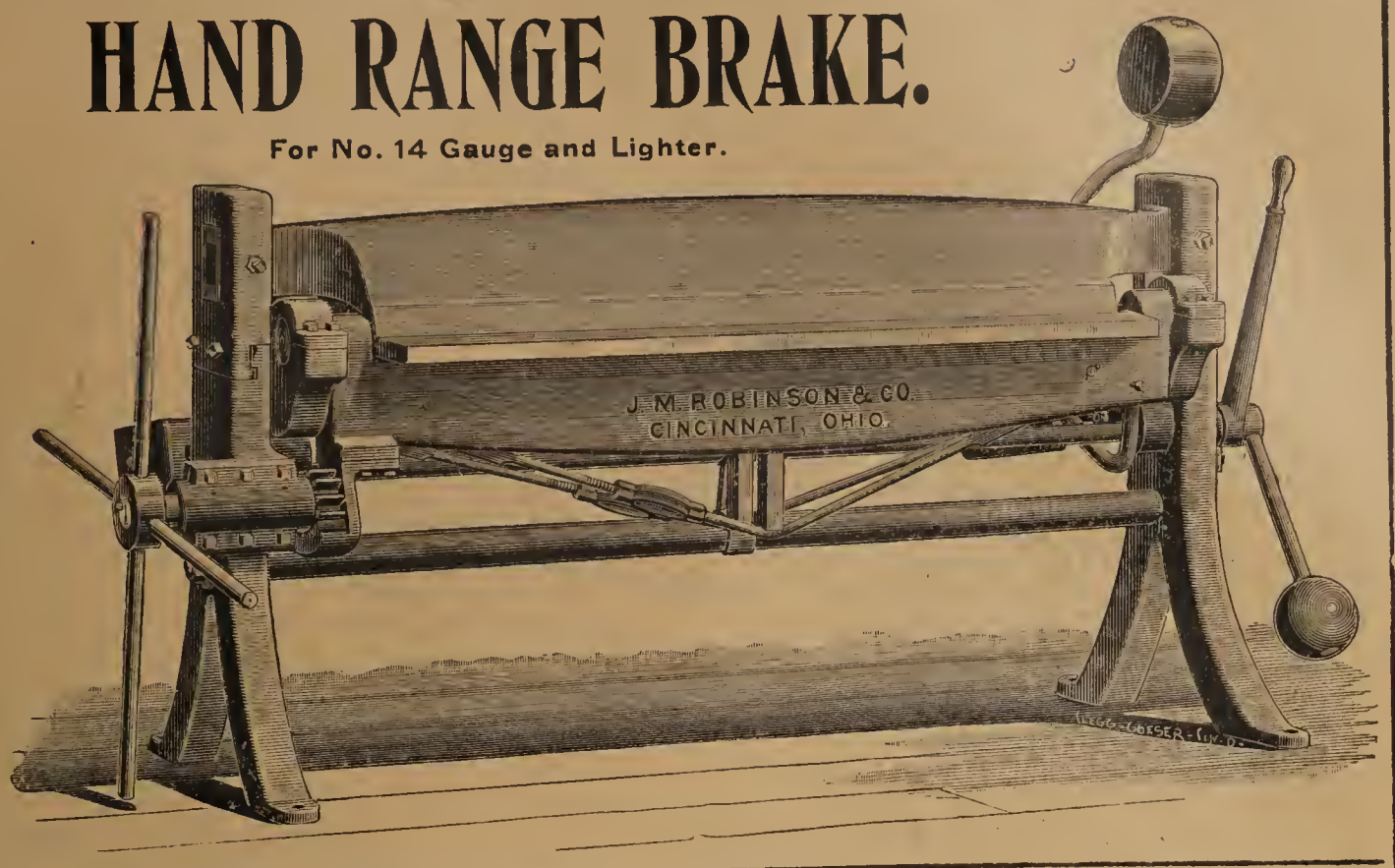
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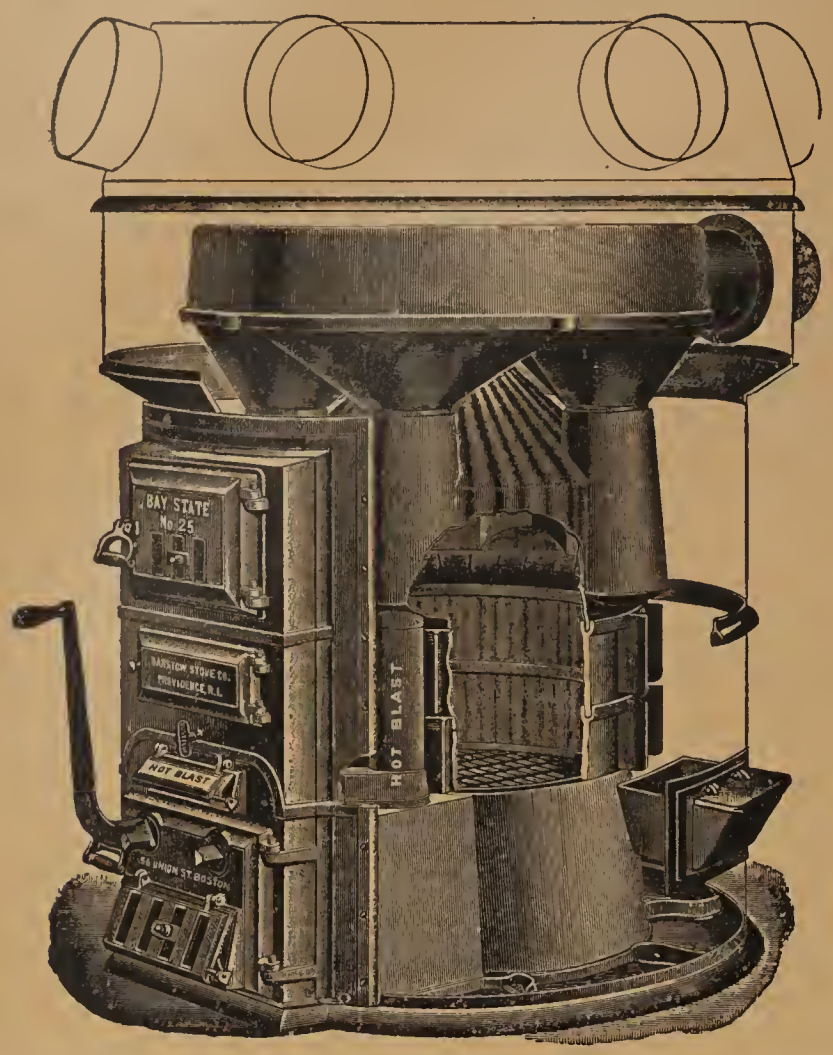
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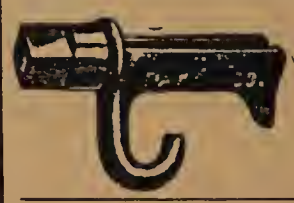
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A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

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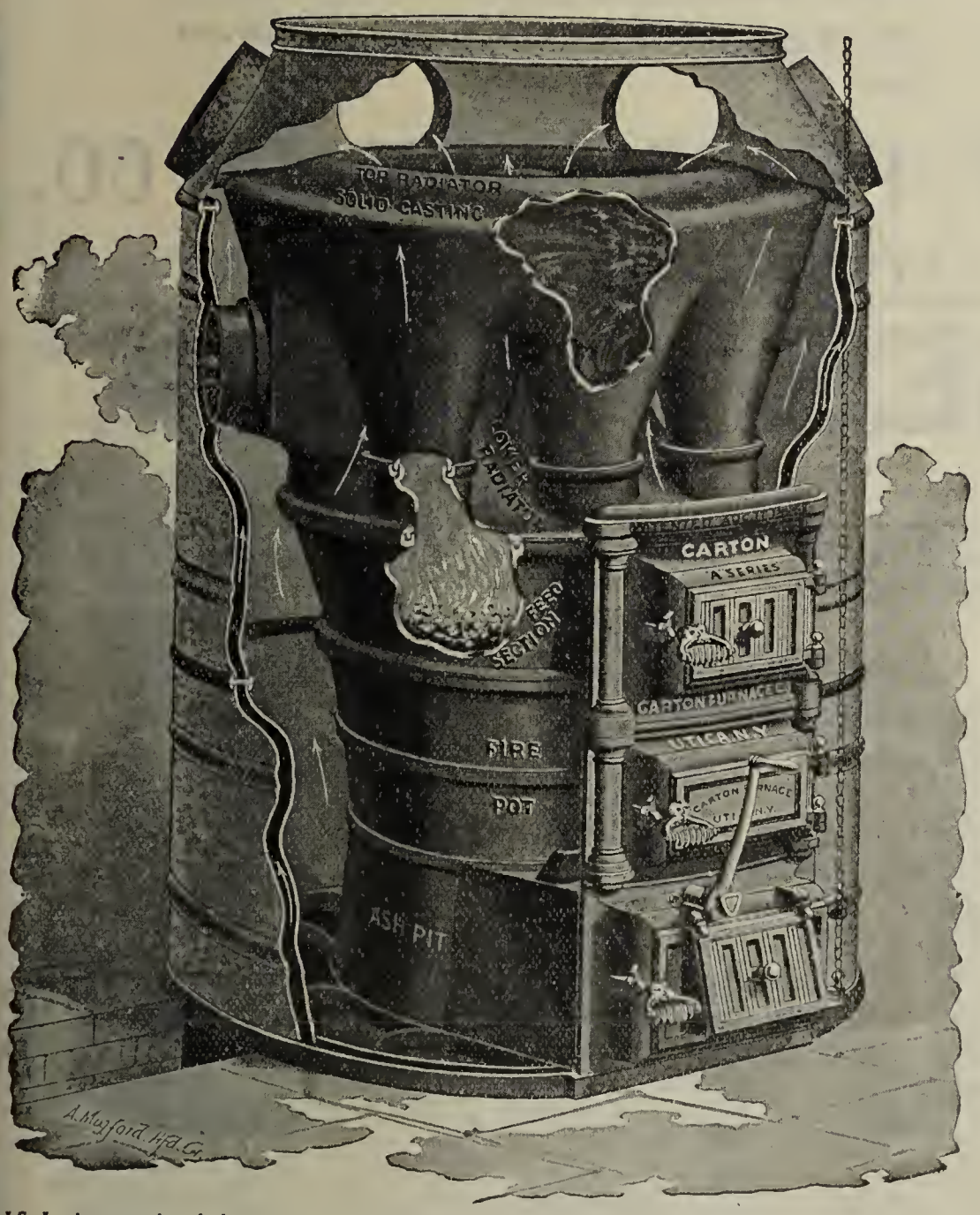
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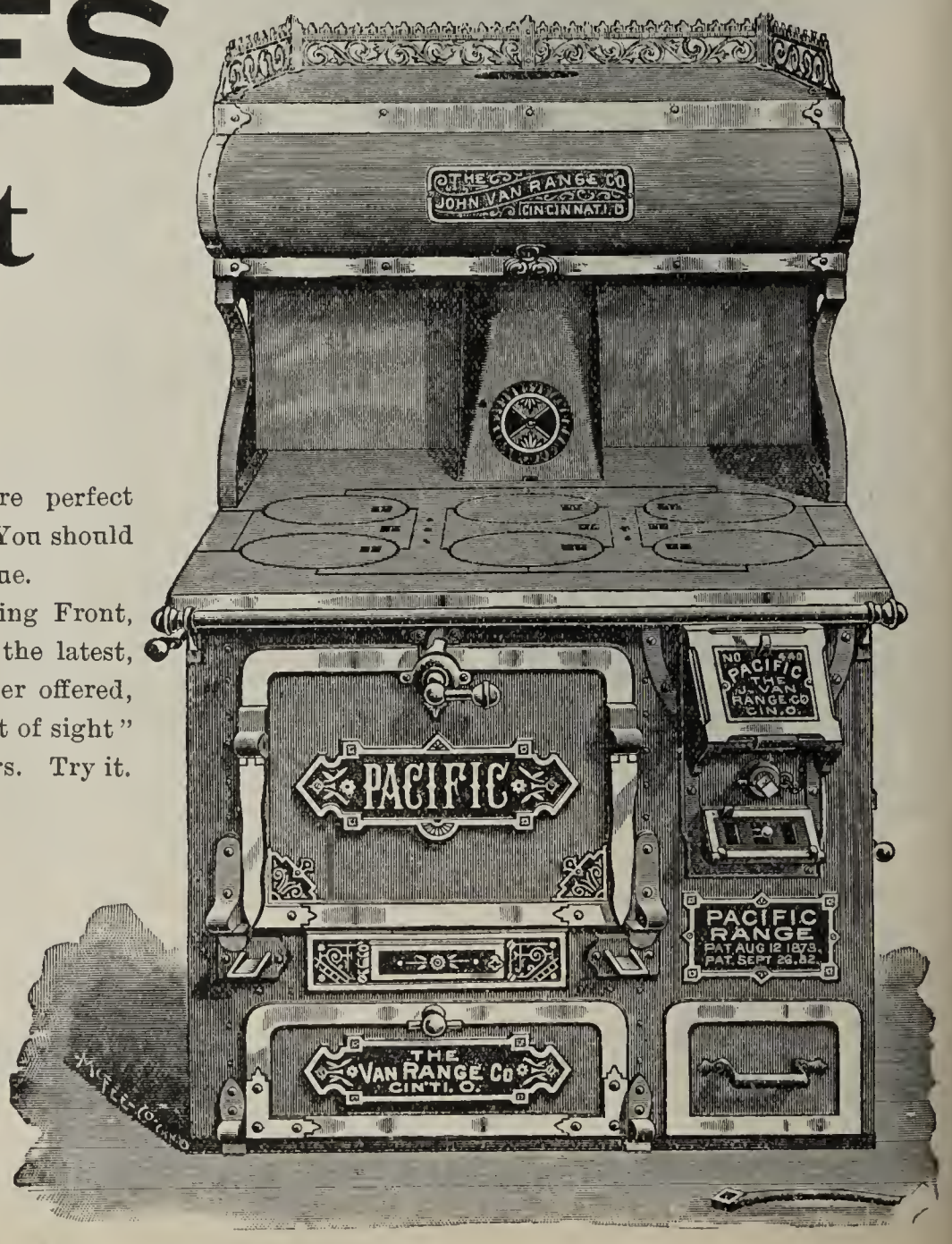
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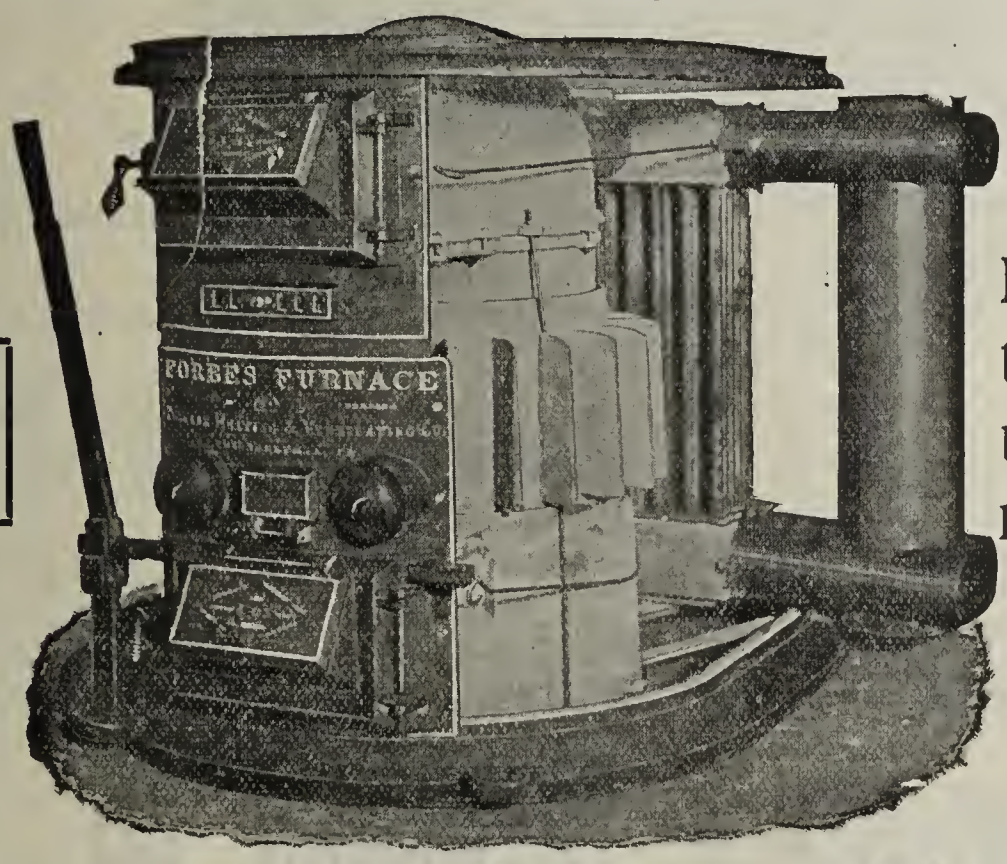
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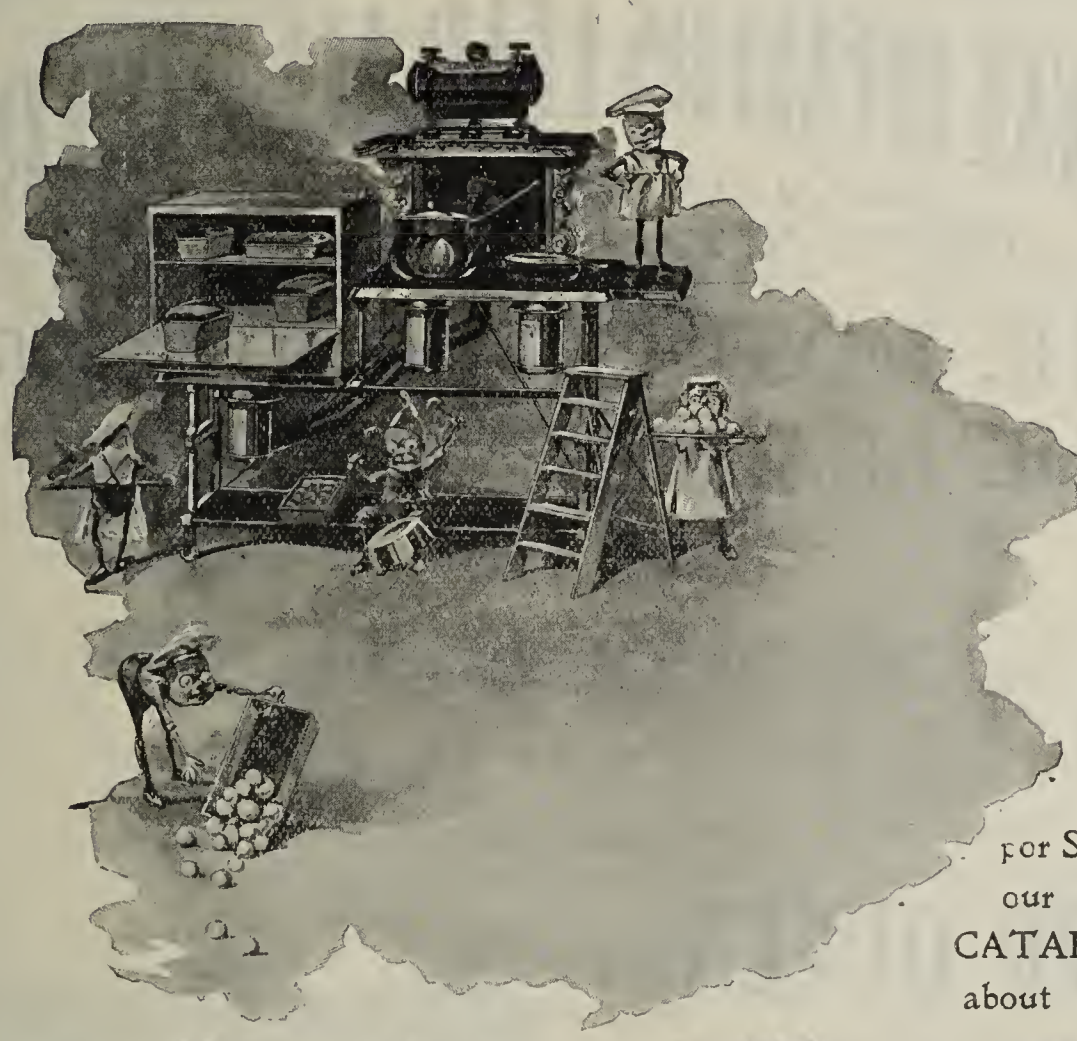
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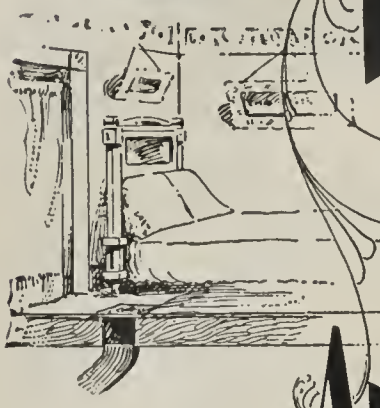
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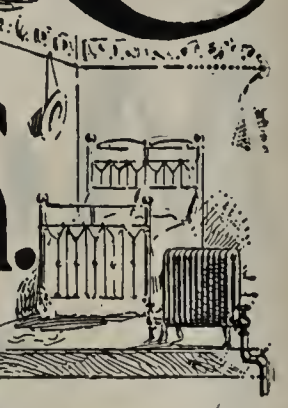
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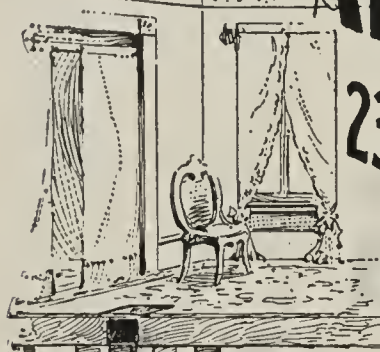


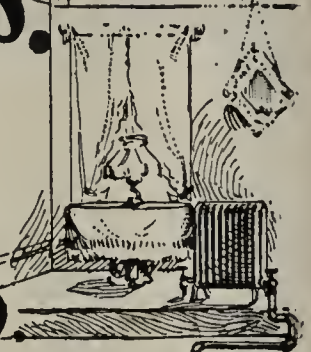


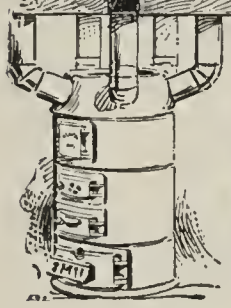
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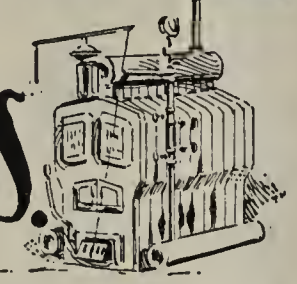






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THE MOSTEST GOODS FOR THE LEASTEST MONEY. . .

The Stove is "all right" and we can prove it to you by sending you a sample. It is ***"Lansing"*** the trade of our contempories and orders are pouring into the ***"Grand Haven,"*** where we take care of them promptly.

THE WOOD QUEEN,

WITH BRACKET RESERVOIR,

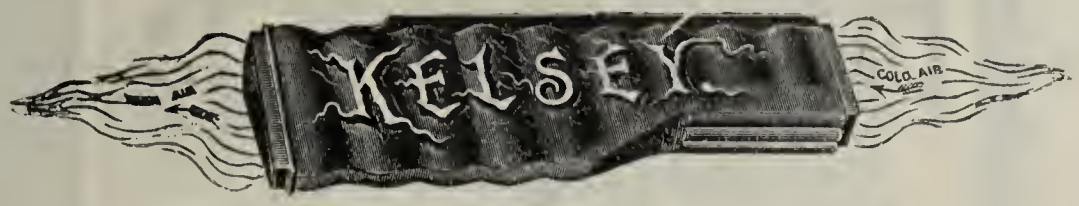
is a great big well made wood stove that is beautiful in design and modern in every respect. We have the first time to place a sample that has not brought in a nice order. Send for prices and secure the agency for your town.



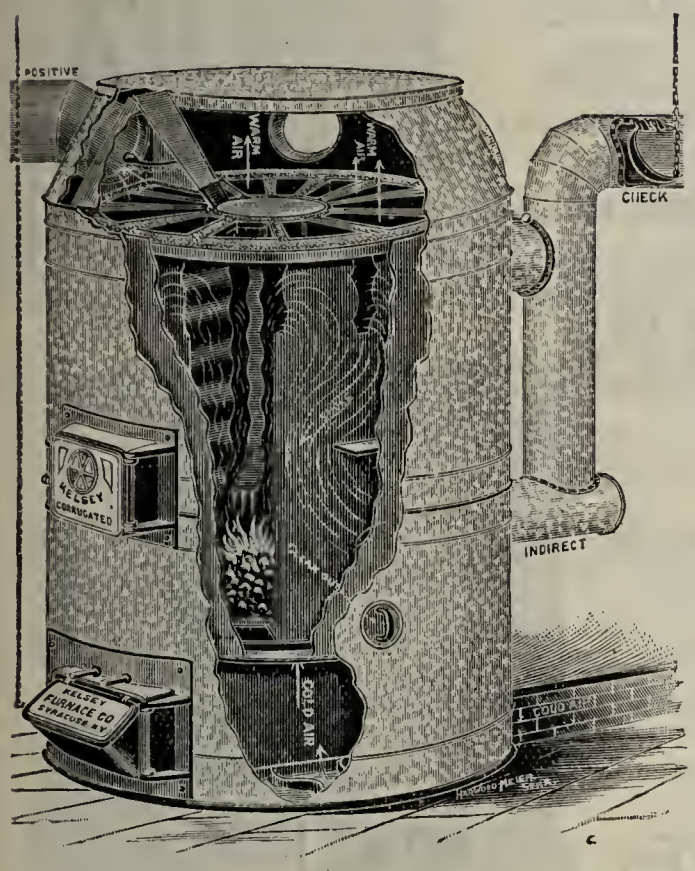
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Warm Air Generators



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They are different from any other heater.

BECAUSE

Their construction is such as begets confidence in their utility.

BECAUSE

They never disappoint their users.

The results we point to below.

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Dealer in
STOVES, RANGES, FURNACES,
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Enclosed please find check to balance my account with you in full to Jan. 1st, 1898.

I have sent you this day a recent issue of the Rome *Sentinel*, in which you will notice, by my advertisement, that I now have 72 different residences in this city heated with Kelsey Generators, and any one of such users would do anything reasonable to aid me in making further sales of same, as they are all pleased with the working of their Heater, and I have never ordered a dollar's worth of repairs from you, during the past five years, for repairing defective parts in your Generator.

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Assuring you of my earnest effort to push the sale of the Kelsey Generator in this city during the year to come, believe me,

Yours sincerely,
JAMES H. McLEAN.

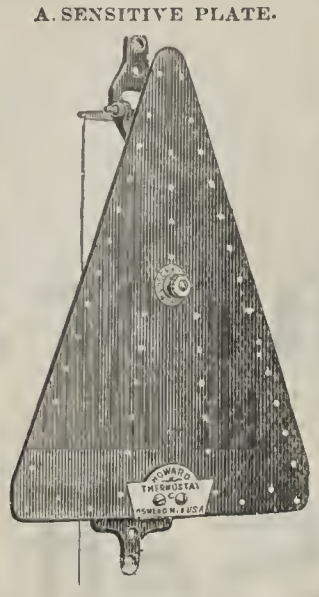
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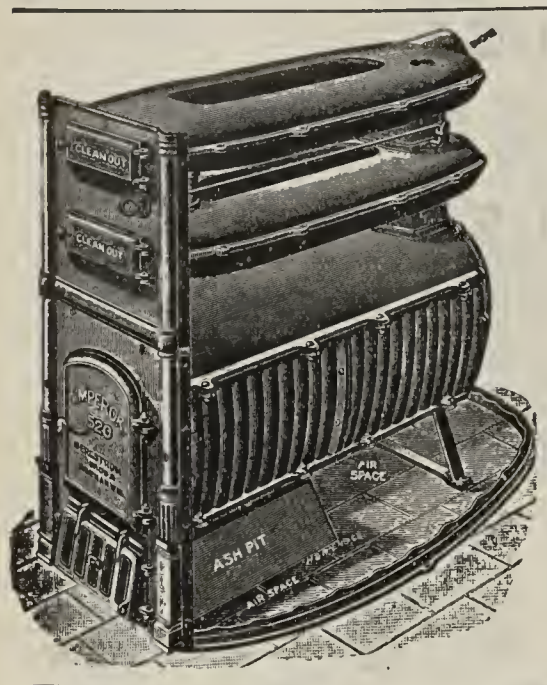
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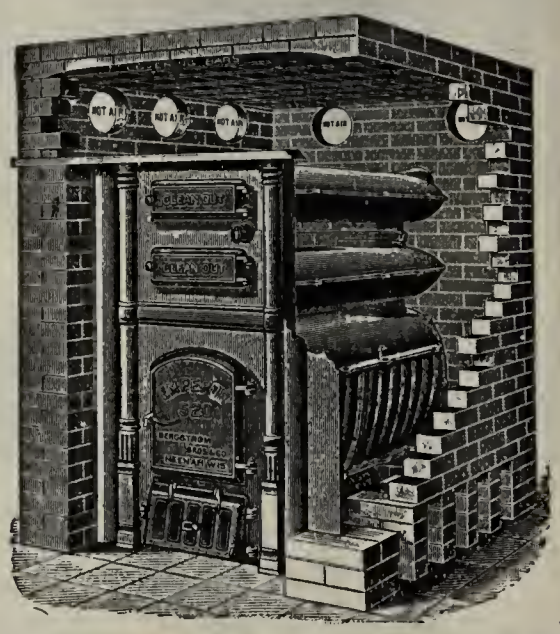
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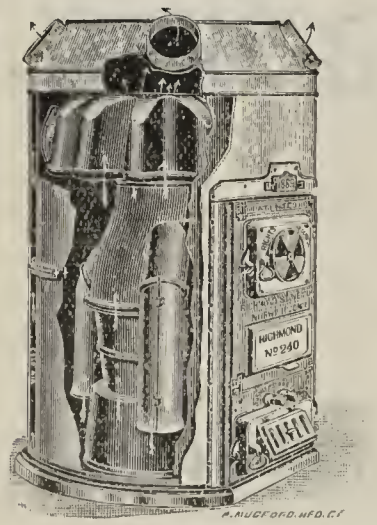
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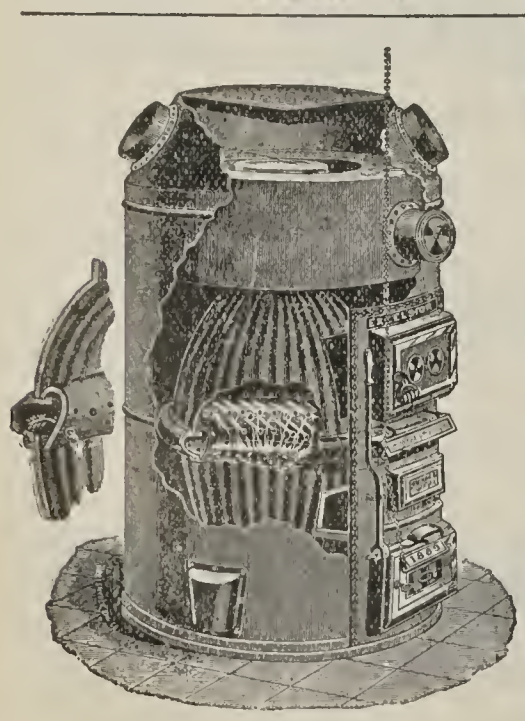
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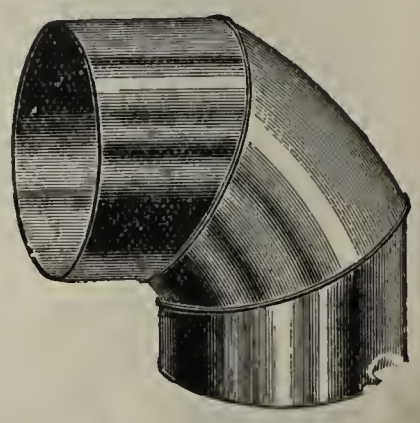
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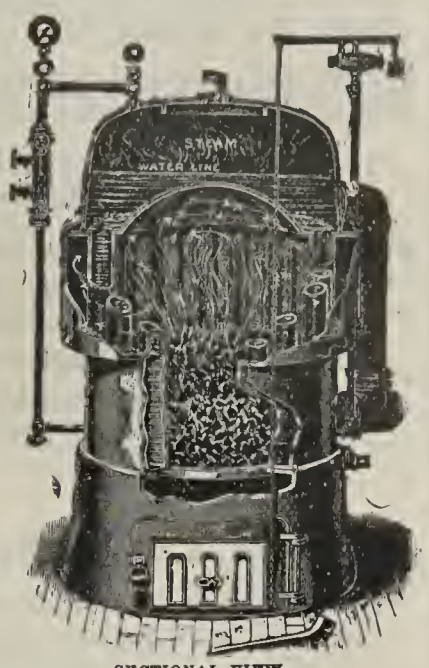
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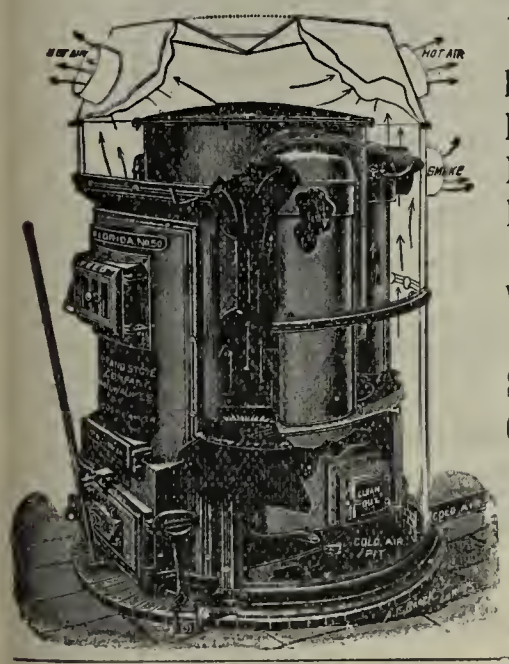
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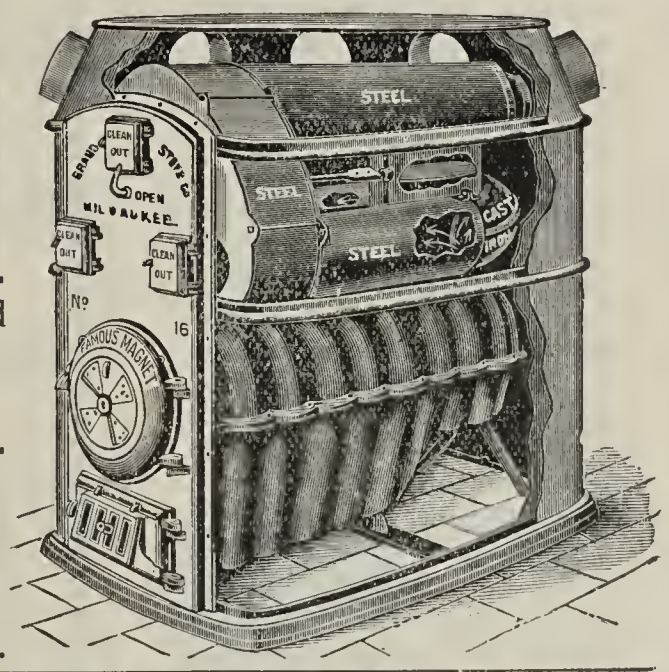
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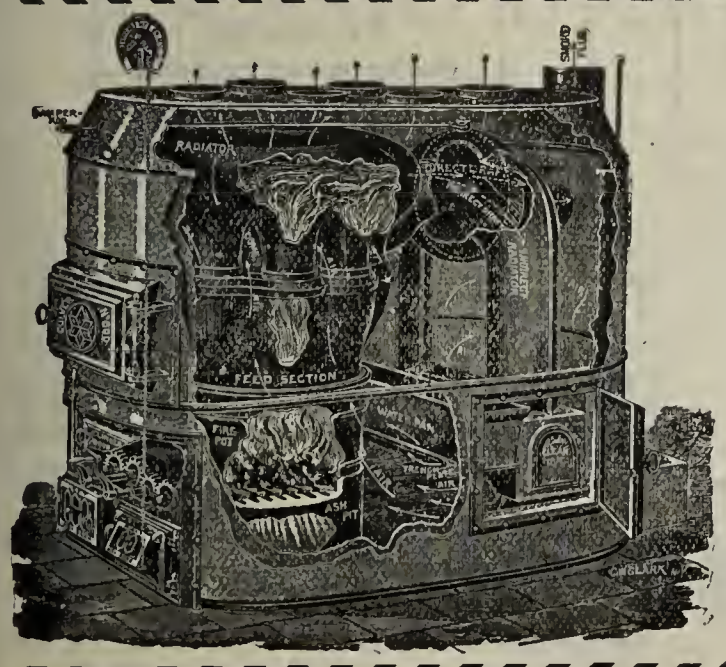
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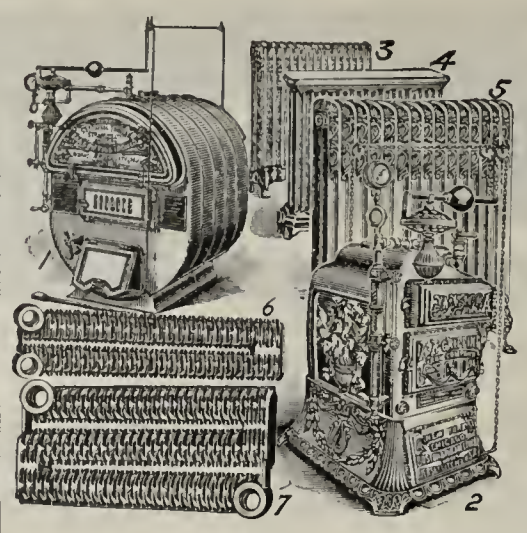
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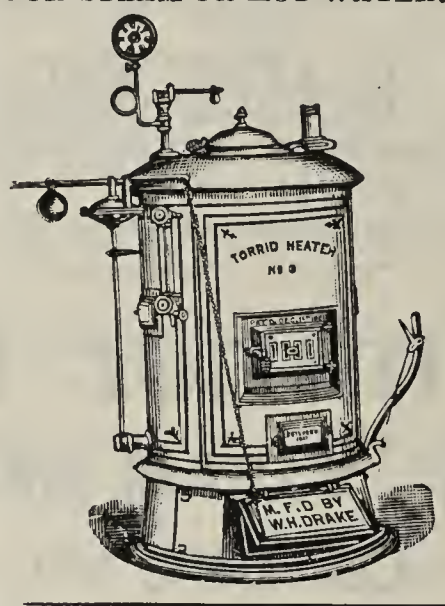
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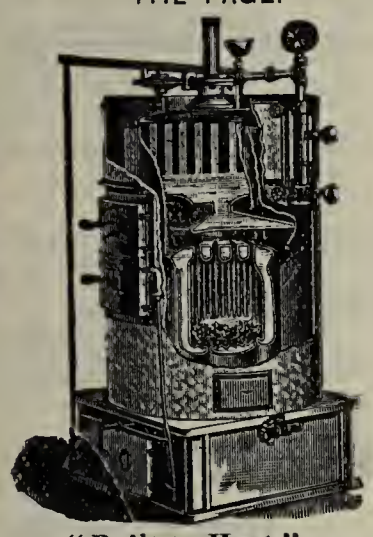
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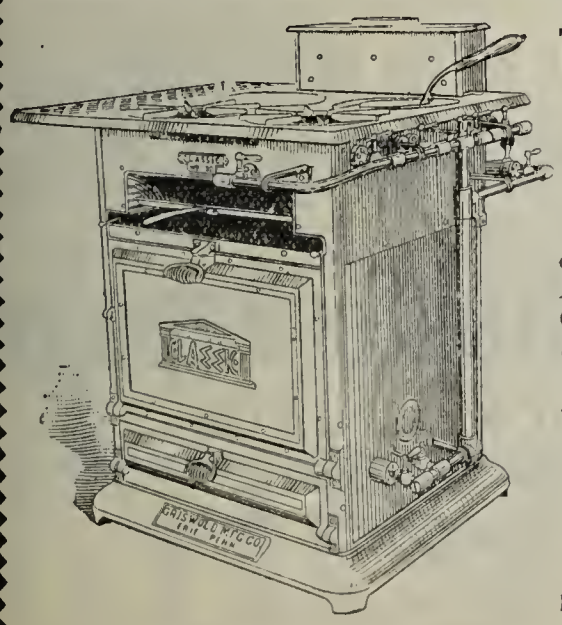
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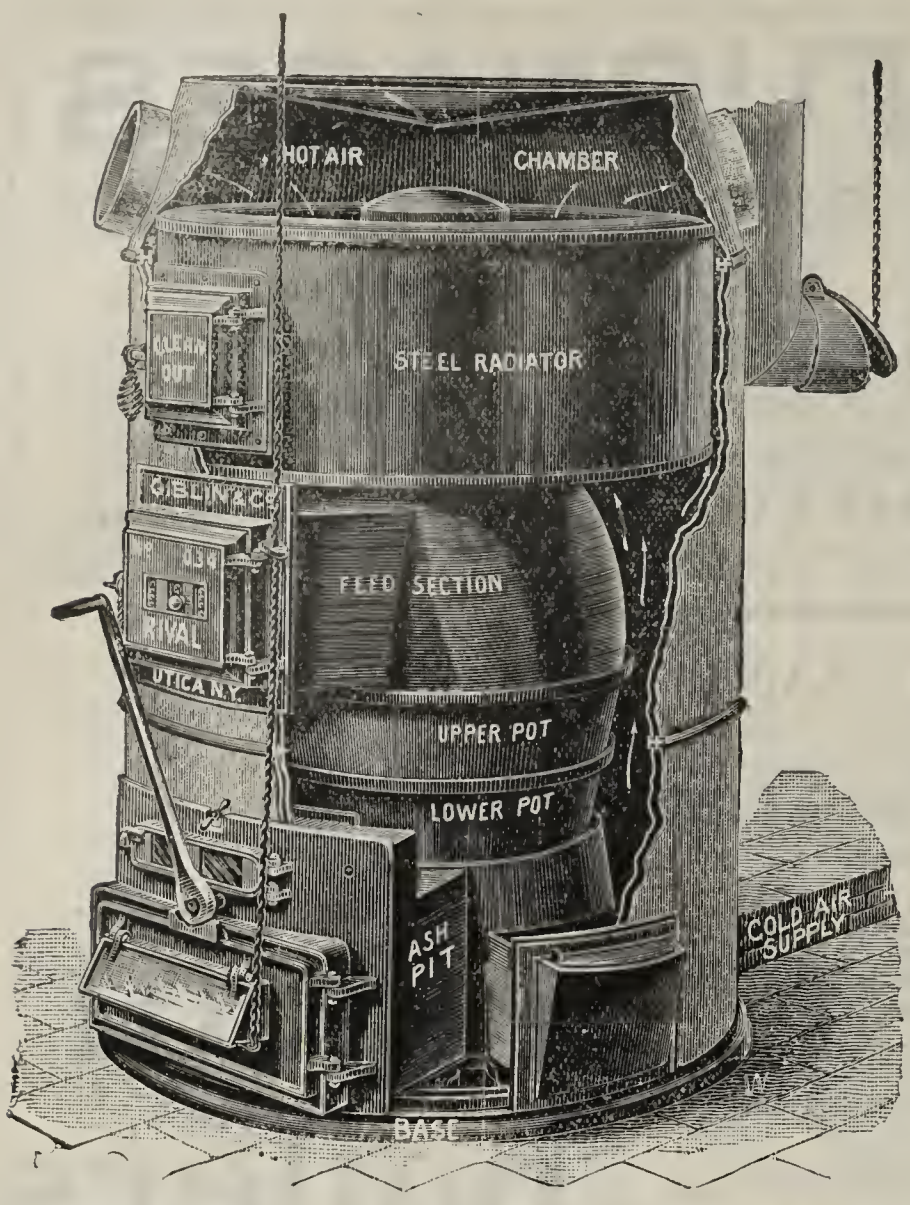
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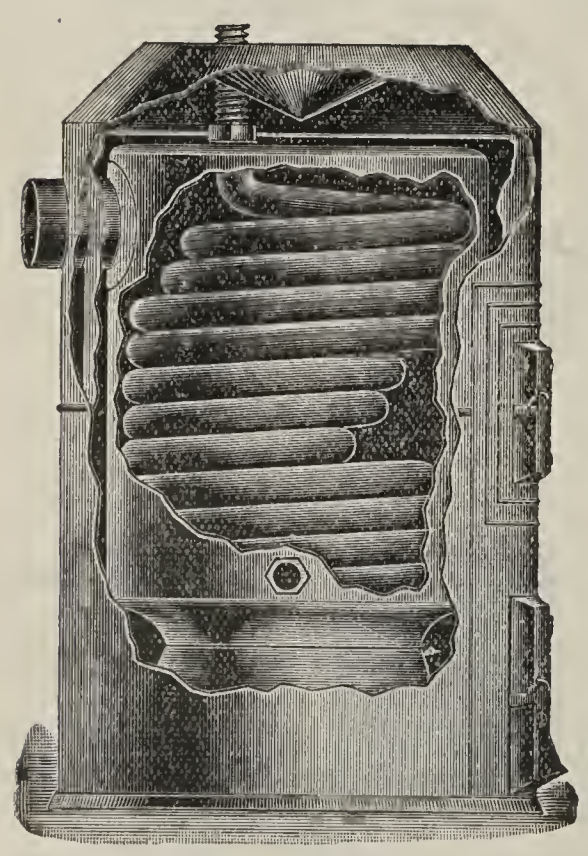
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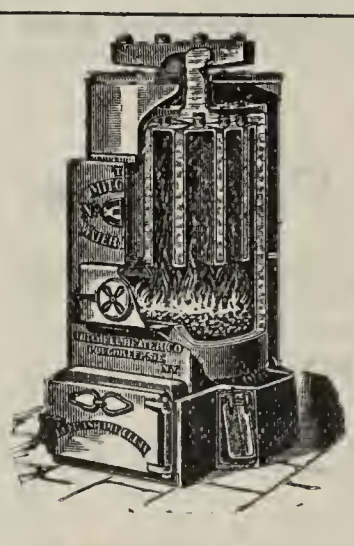
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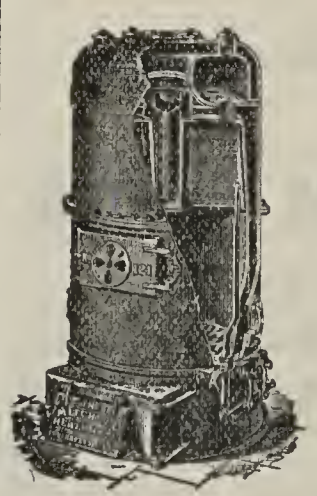
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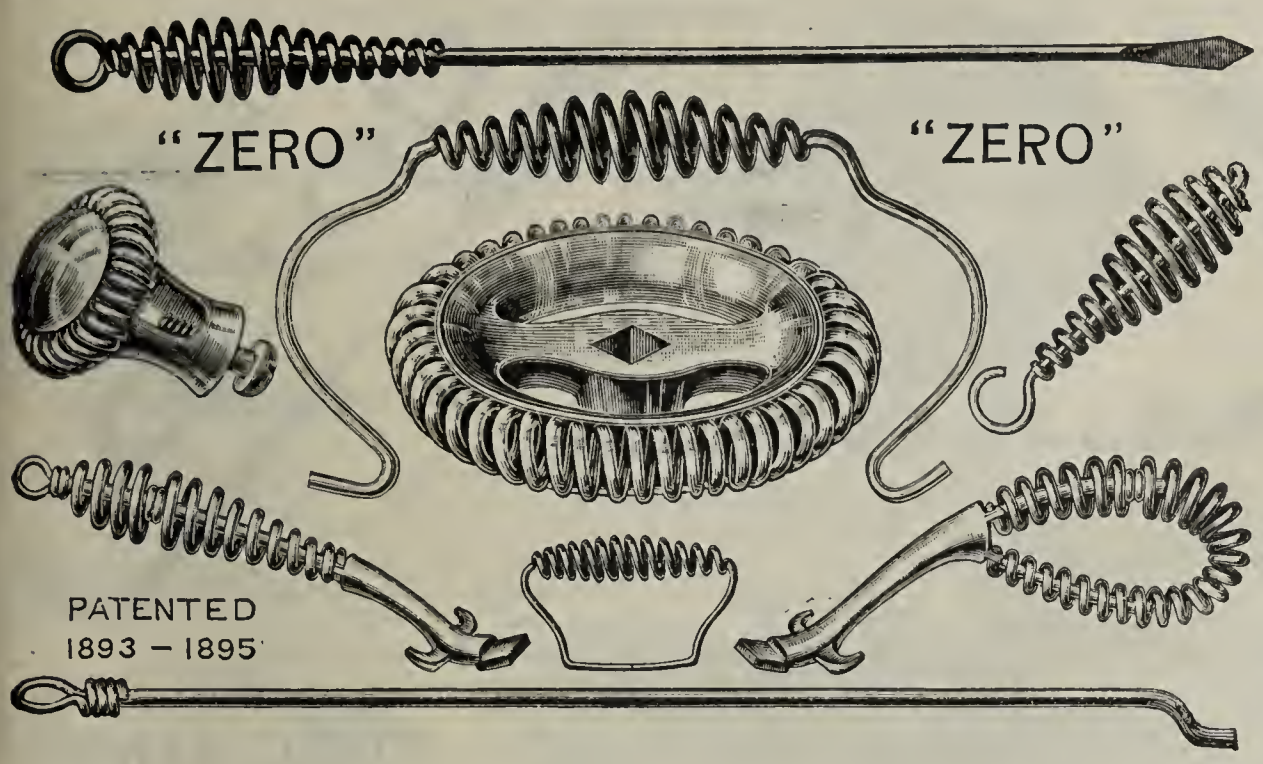
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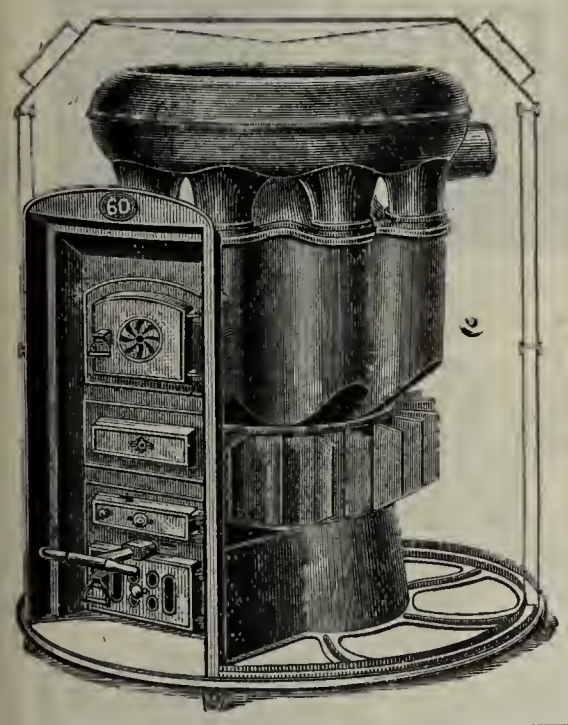
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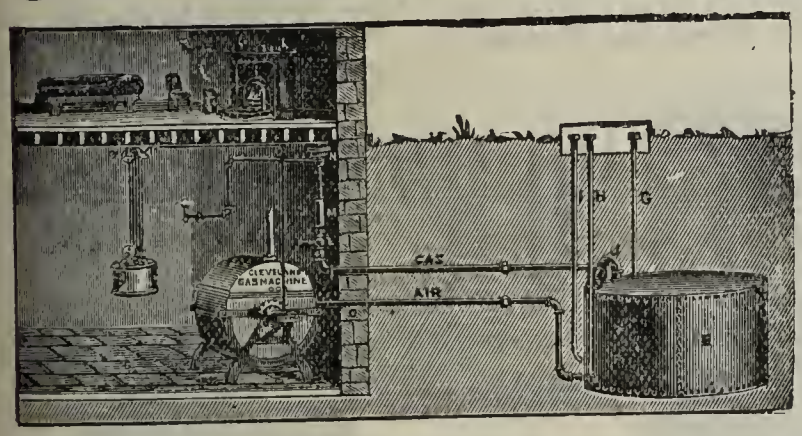
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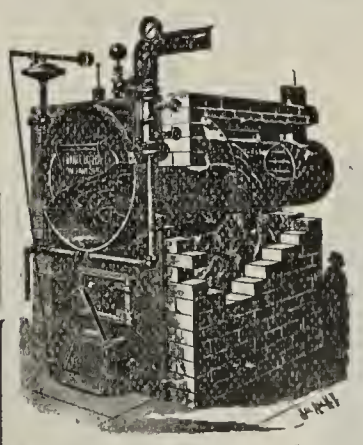
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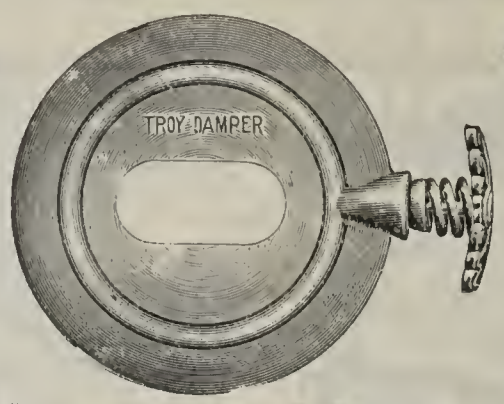
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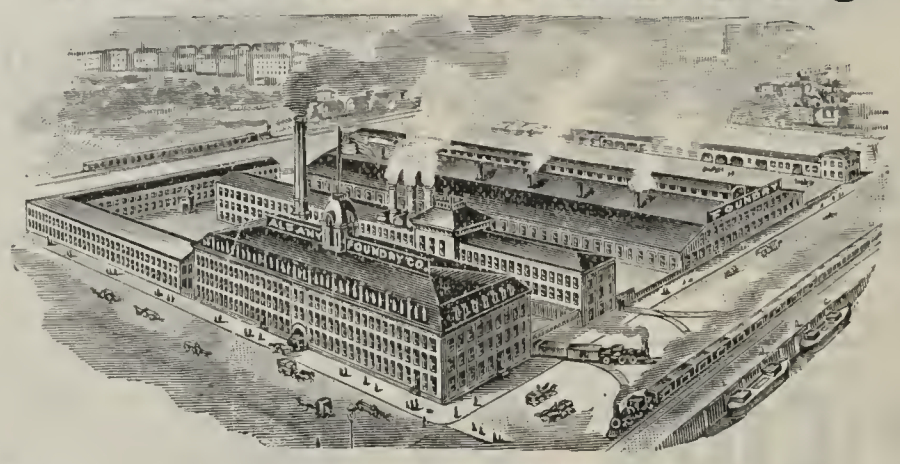


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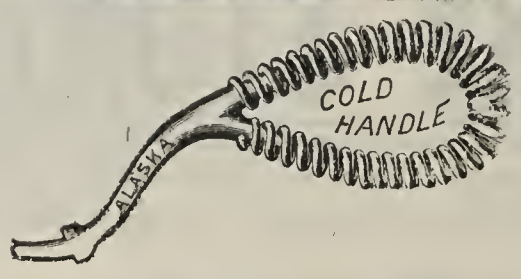


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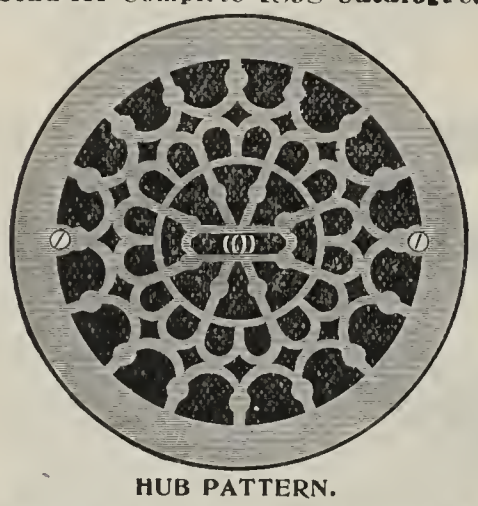
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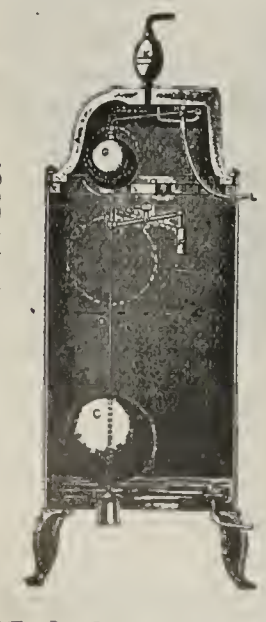
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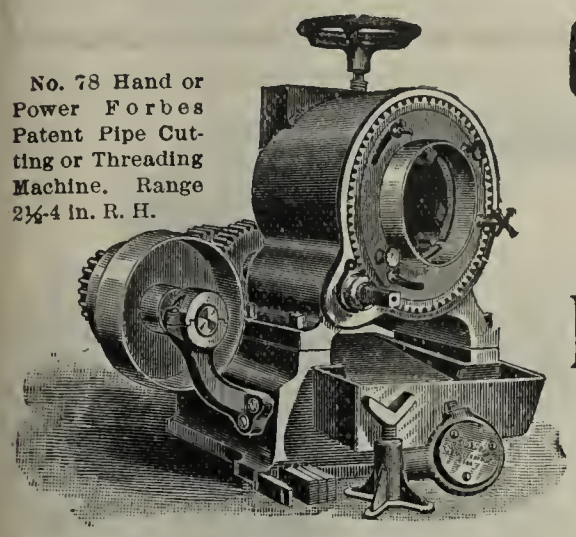
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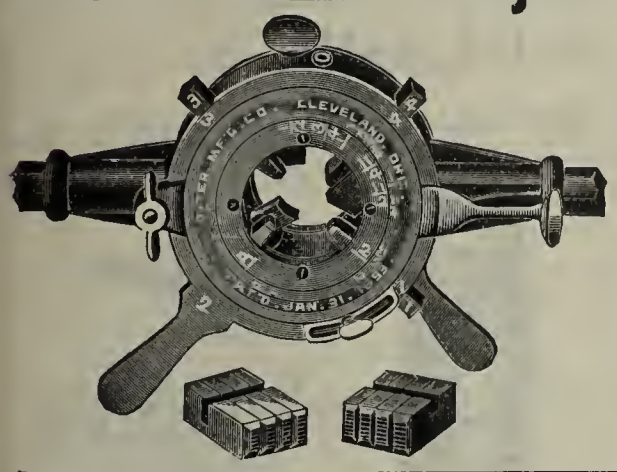
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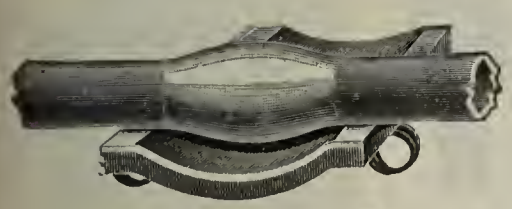
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TABLE OF CONTENTS.

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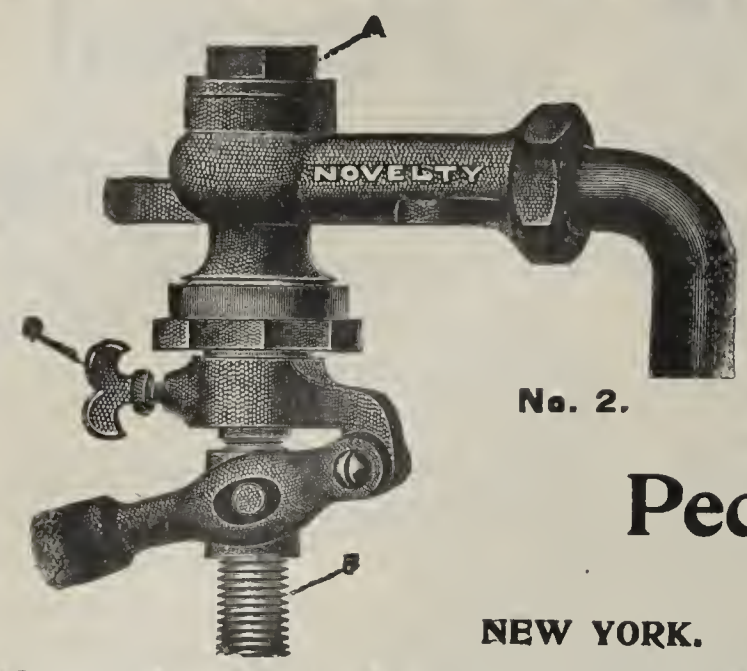
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The Distillation or Manufacture of Coal Gas,
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Connecting the Meter in Buildings,
Inspection of Material and Work,
Laying Out Pipe,
Gas Fitters' Tools,
Piping the Building,
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Gas Logs,
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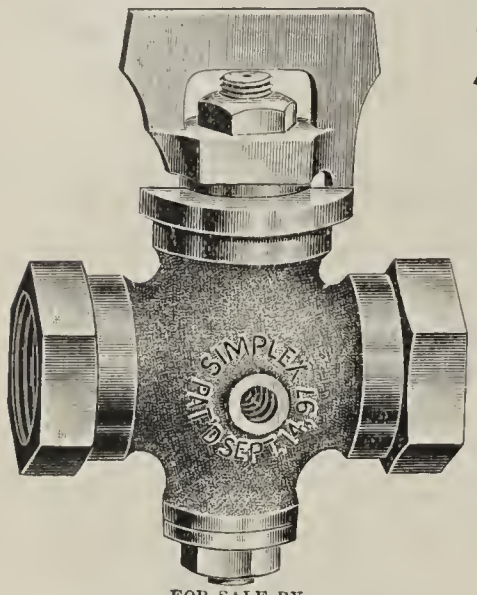
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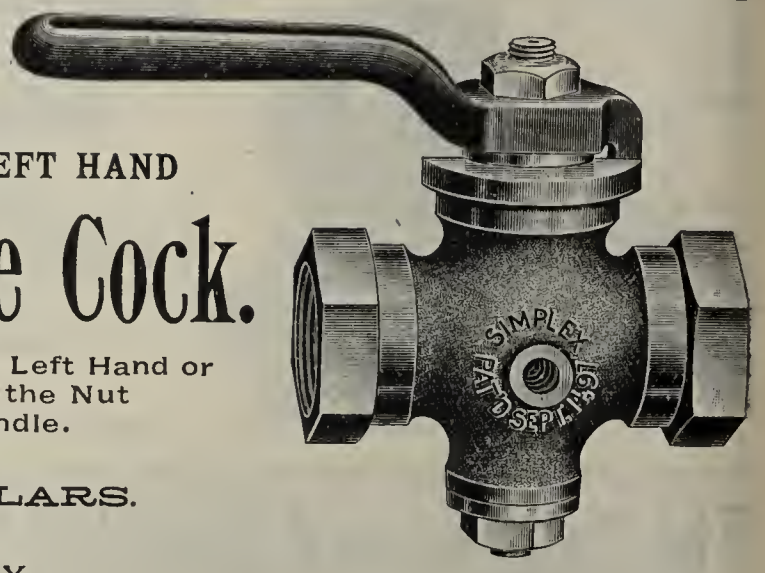
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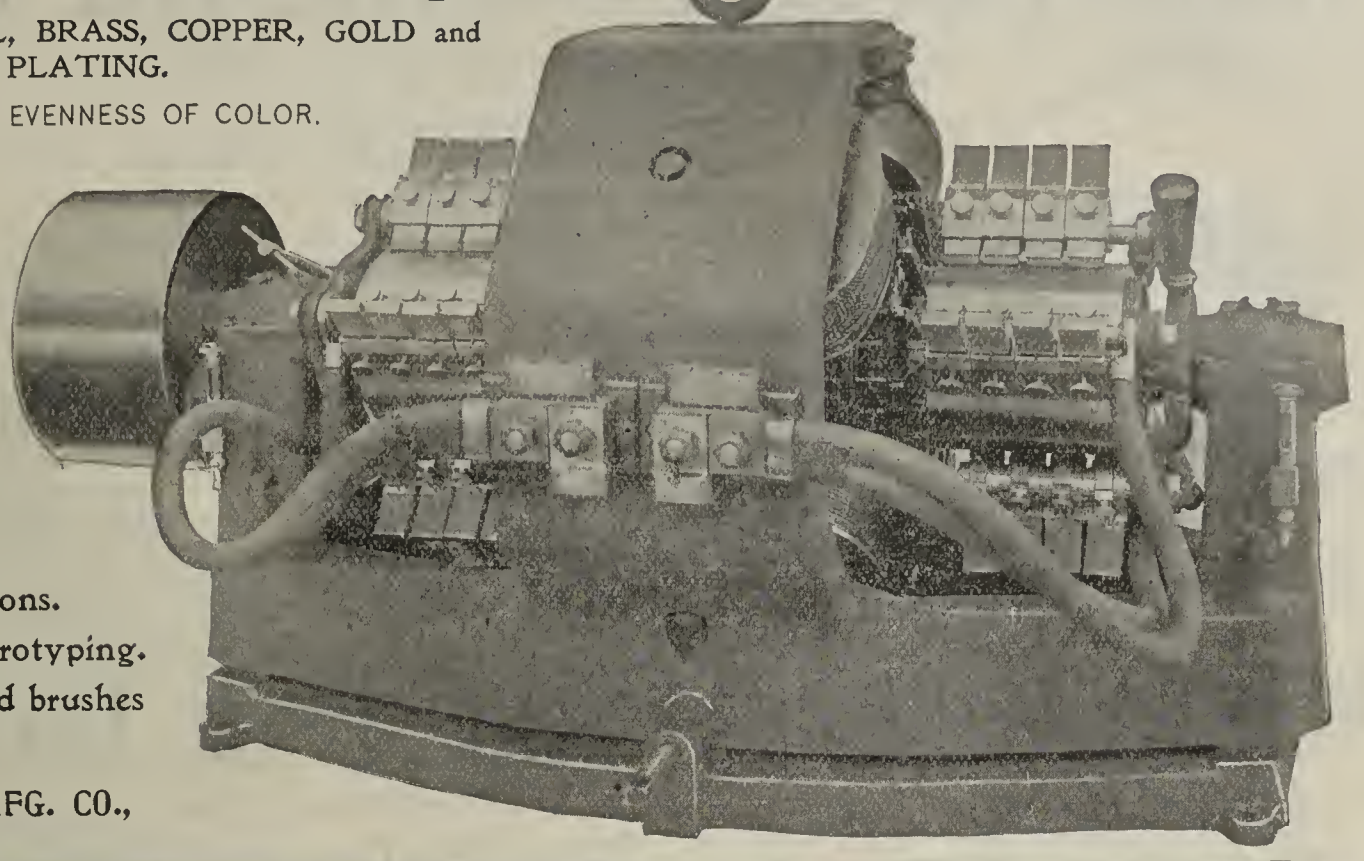
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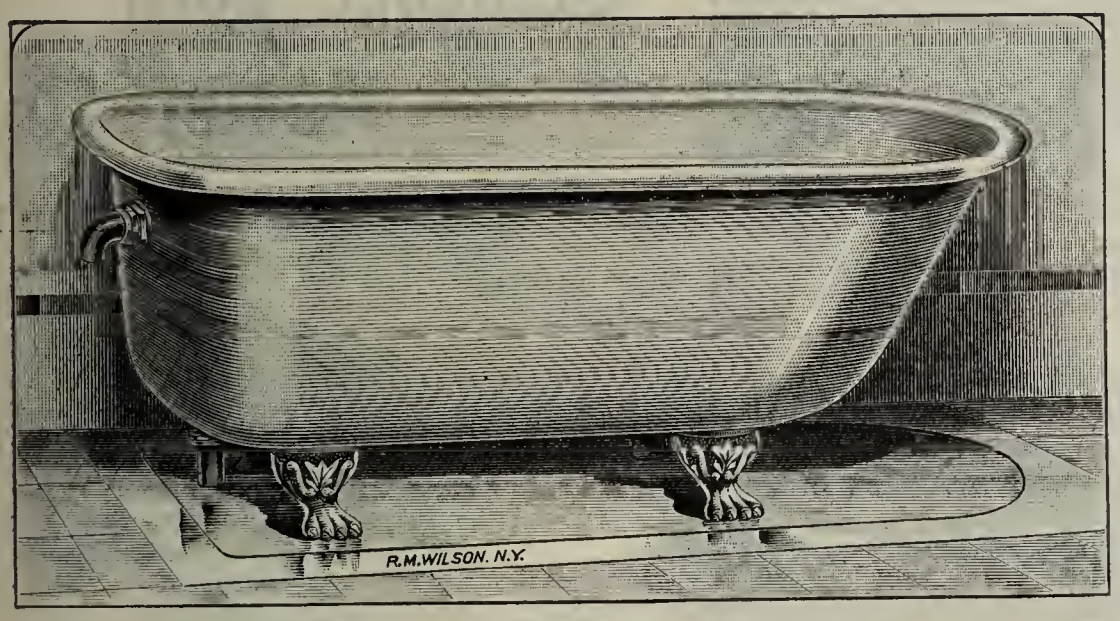
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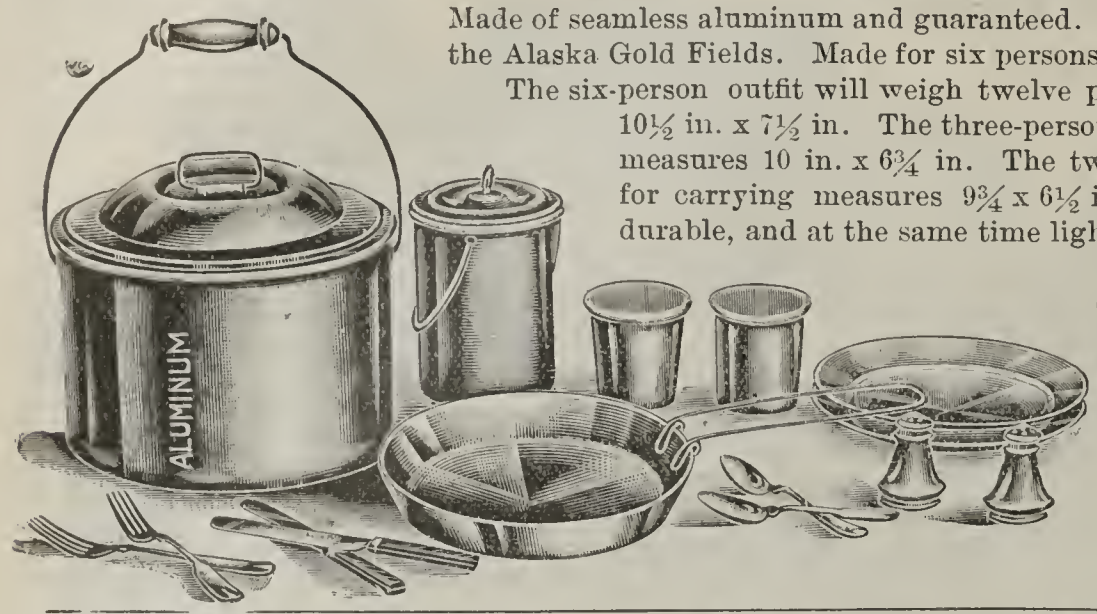


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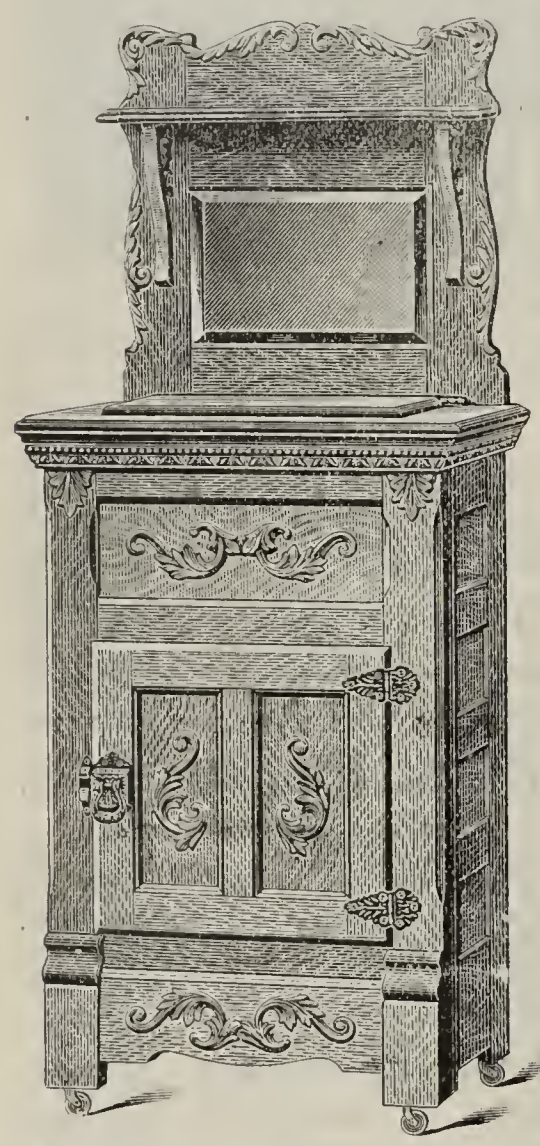
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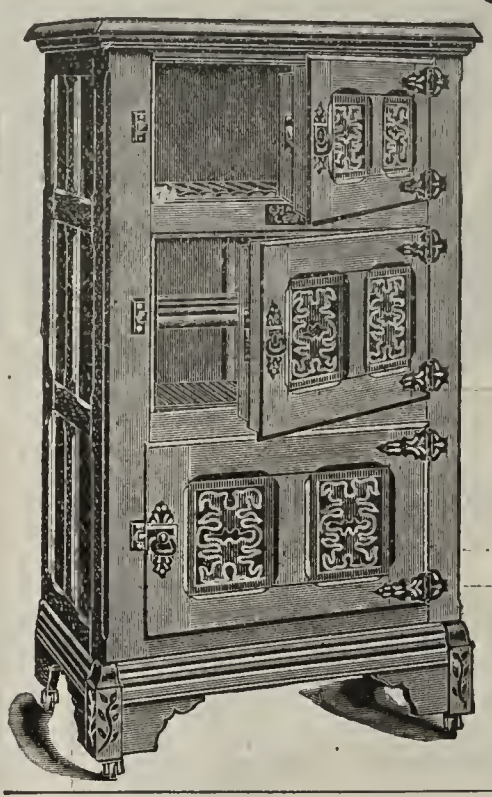
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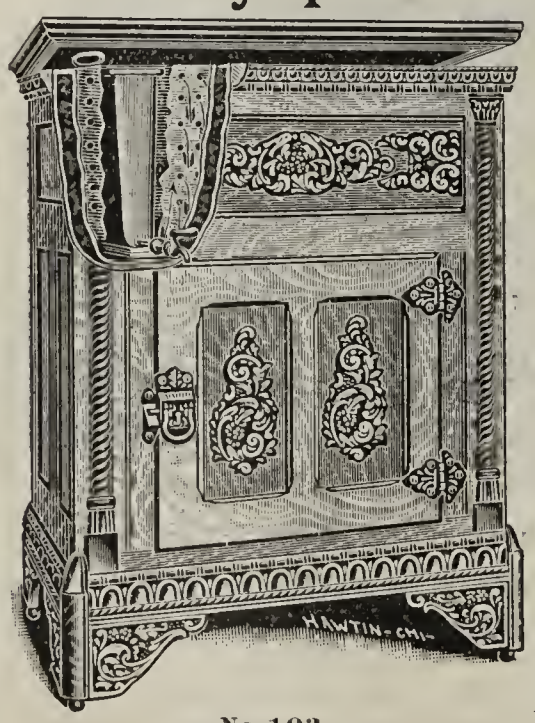
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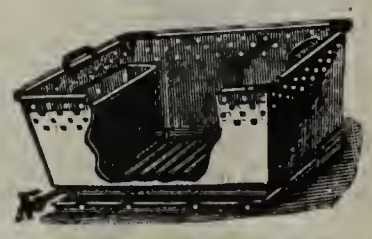
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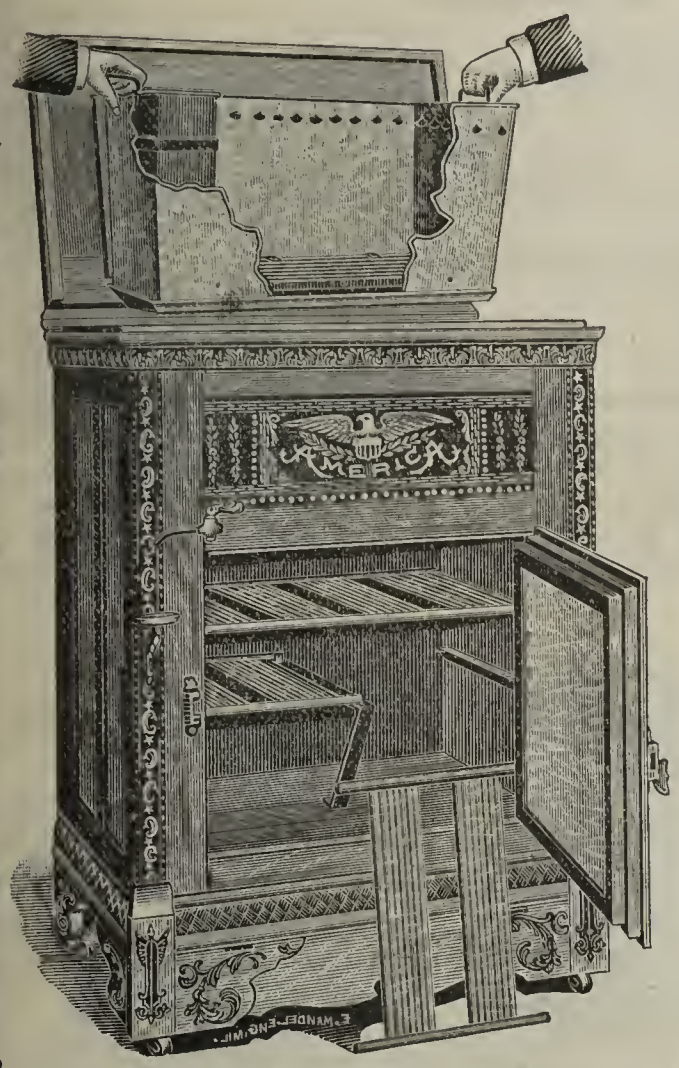
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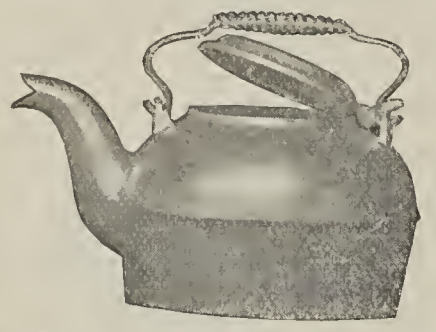
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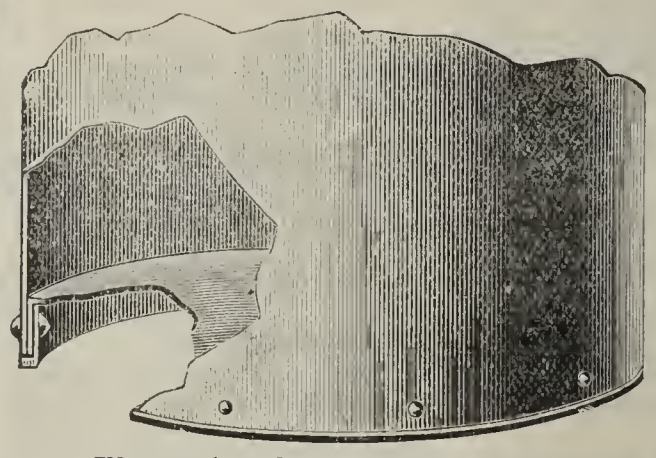
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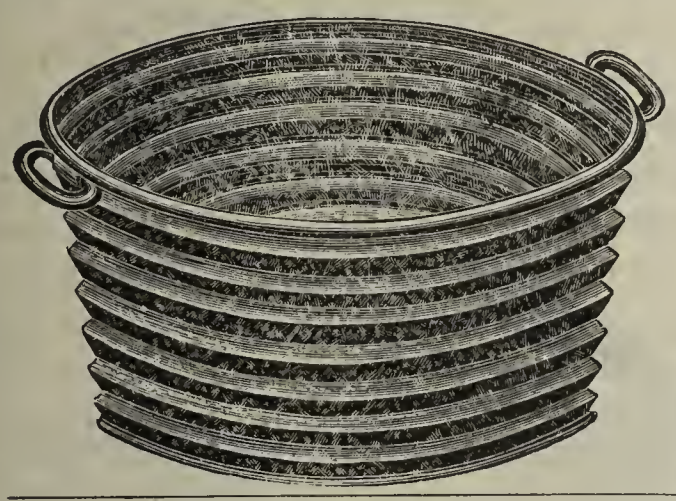


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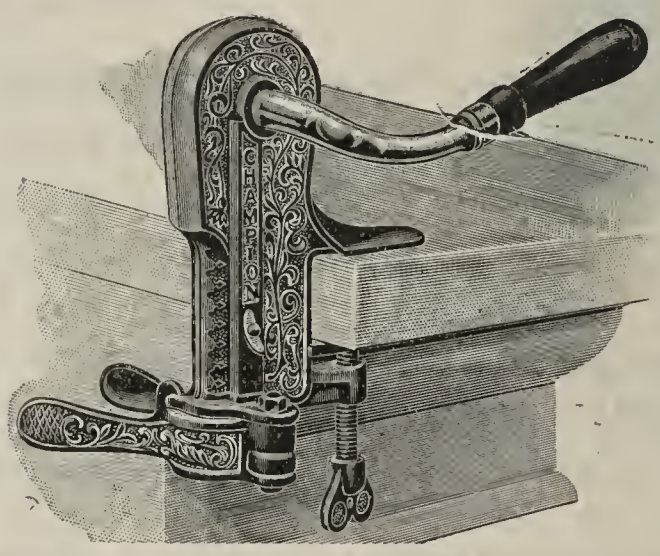
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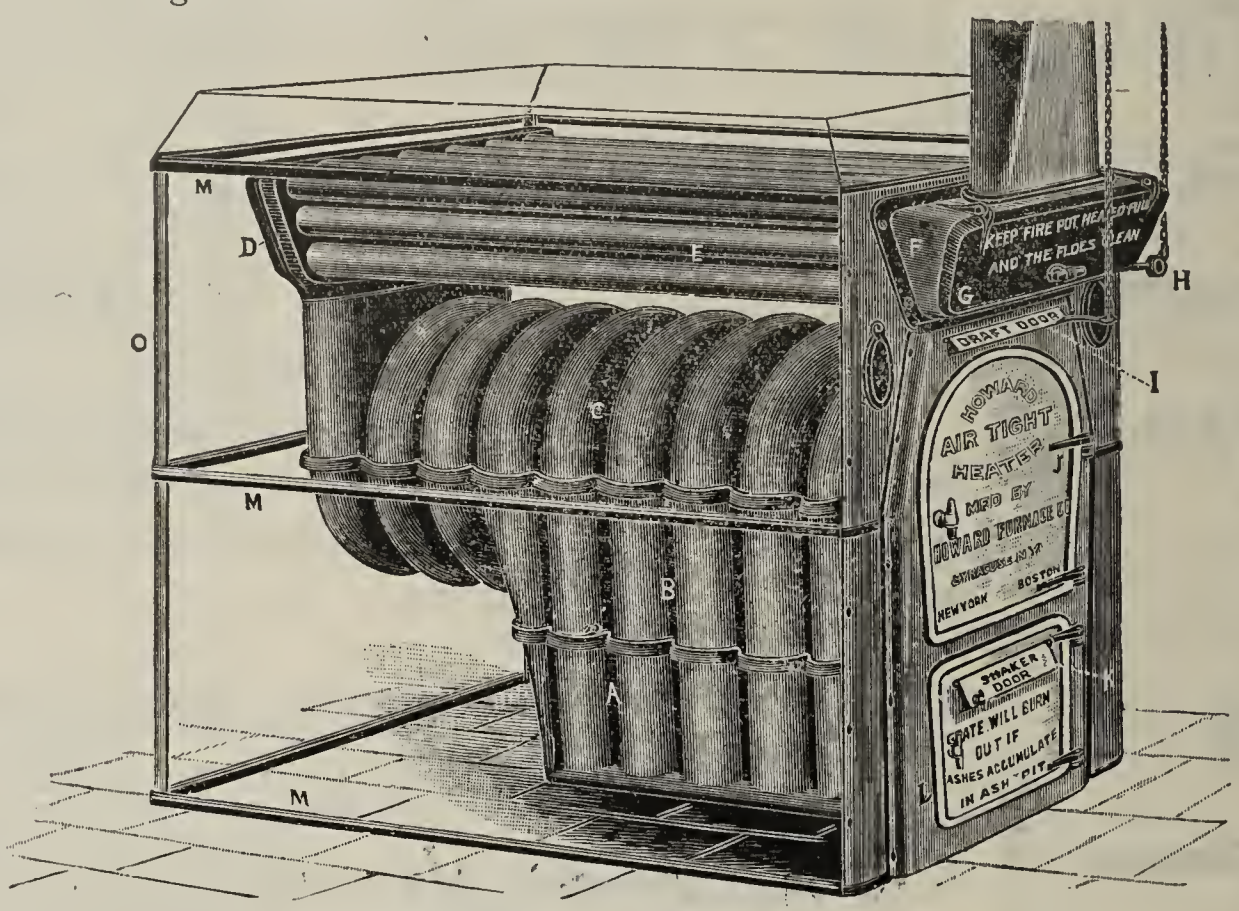
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THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, February 12, 1898.

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The Business Situation.

The business movement continues unusually active, with a volume greater for the season than in any previous year. This is indicated not alone by the convincing statistics of bank clearings, railway earnings and exports, but also by the reports of individual merchants and manufacturers all over the country. Spring trade is setting in unusually early, and activity reigns in almost all lines. In some sections the distribution of merchandise is still impeded by the condition of the roads, but the effects of last week's storms are passing away with the return of more open weather. The leading manufacturing industries are all busily employed, with the exception of the New England cotton mills, which are still crippled by the strike. A significant sign of expanding trade is given by the growing business in commercial loans, which shows a considerable increase over former years. New York bankers report a remarkably good demand for money from their customers in all parts of the country, with indications pointing to continued extensive loaning in the future. The easy money rates now ruling, which promise to prevail through the spring, and the existence of an abundance of loanable funds in the banks, are entirely favorable to such a development. The New York banks now hold nearly $35,000,000 of surplus reserve, and a similar condition prevails in other money centers. The low record of business failures is a very encouraging feature of the situation. *Dun's* report showed a decrease of failures in January of about 300 in number, compared with previous years, and in liabilities 43 per cent. compared with last year, 62 per cent. compared with 1896, 32 per cent. compared with 1895, and 68 per cent. compared with 1894. The stock market this week was unsettled by another of its periodical Spanish war scares, based on the introduction of a Cuban belligerency resolution in the Senate and the sensational De Lome incident; but the market maintained its underlying strength and values held their own remarkably well. There has been a record breaking demand for bonds, with sales averaging about $6,000,000 a day and a decided appreciation in values. Last month's total of bond transactions, $93,078,500, was larger than ever before known, showing that money long idle is again seeking profitable investment. In pig iron the apprehensions of an overstocked market have been relieved by some very heavy buying by large interests, and the price of Bessemer pig has been advanced 40 cents a ton at Pittsburgh. The metal market shows no noteworthy change, although tin and spelter are firmer. Retail trade is picking up in all quarters and collections are reported as generally satisfactory.

Geometrical Drawing for Pattern Cutters.

We call the attention of those of our readers who are at all interested in pattern cutting to an article elsewhere in this issue by the author of the "New Metal Worker Pattern Book," on the value of geometrical drawing as exemplified in the case of the pattern for a bifurcated pipe. The article has been carefully prepared, and is written in very condensed style, and will need, therefore, strict attention in reading, or, properly speaking, studying; for it must be borne in mind that the difficulties of pattern cutting are not mastered at a glance, but can only be resolved by painstaking effort. The subject of drawing treated in this article is one that has received altogether too little attention from the pattern cutters, and the young men especially who are ambitious to excel in this line will be amply repaid for giving it studious attention. If in connection with it any question arises, or any point seems obscure, we should be very glad to have our correspondents write us freely, and we will then explain any points that may have been indistinctly stated and amplify wherever the article has put the subject in too brief and condensed a form.

The Use of Possibles.

BY FOSSIL.

We have all heard the expression, "Make a spoon or spoil a horn," used figuratively in regard to an intent or action whose result was doubtful, and the phrase has been taken to mean what may be called an experimental perseverance which is not sure of making a spoon, but will not be satisfied with any other disposition of the horn. It would be wrong to have, for a failure in making, only the alternative of marring, because if discarded for the original purpose the horn may become useful in some other way, and he who is economically wise will seek for some method to utilize his failure. It has been said that everything will become useful if kept long enough, and this is in a degree truthful, for the seeming exceptions grow less in number under the transformations of chemistry and the adaptations of invention. Care of the specials and probables is expected and common, but there may be a lack of the attention which should be paid to possibles in view of their undetermined value. The faculty of seeing that which is not seen, as a sculptor does the statue which lies hidden in a block of marble, is not found in superficial observers, neither do the capabilities of things appear to those who take only a special and confined view of them. When Lord Timothy Dexter of eccentric memory shipped warming pans to the West Indies it was considered a very foolish venture by those who saw in the warming pan nothing but a warming pan; but when the consignee sold them readily for molasses ladles there was a change of opinion. Discovery and invention are nearly related, the former being senior; and he who has eyes to see possibles will be most likely to have brains to use them.

THE LETTER BOX.

Power of Centrifugal Pump.

From F. E. A., Shawneetown, Ill.—The city of Shawneetown is protected from the overflow of the Ohio River by a levee on three sides, extending to the hills at the back. When the river is up and the sewers are closed several hundred million gallons of water accumulate in the flats in the lower part of the town. The Board of Aldermen purpose putting in a pump, as you will see by the accompanying clipping, where it is stated that a centrifugal pump 18 inches in diameter, with a capacity of 1,000,000 gallons per hour with a 200 horse-power engine, is to be employed. I am under the impression, however, that they have overrated the capacity of the pump. Haswell, page 290, puts the capacity (maximum) of an 18-inch pump at 12,000 gallons per minute. This, however, is a different pump. The suction pipe is to be 26 feet long, and the pump will have to lift the water 22 feet. If there is any way to ascertain the amount of water the proposed pump will take out in a given length of time, please let me know through *The Metal Worker*. You will see by your list that I have been a subscriber almost from the start. I get a great deal of valuable information from *The Metal Worker*, and in this instance I don't know where else to apply for it.

Answer.—The statement made in Haswell's book as the experiments of M. Tresca in France 36 years ago do not represent the best practice of to-day, and we do not find our correspondent's quotation of 12,000 gallons (maximum) for an 18-inch centrifugal pump. Tresca's experiment with an 18-inch pump with 30 horse power gave a flow of only 2025 gallons per minute at 33 feet hight. The most economical work of an 18-inch centrifugal pump is quoted at from 6000 to 11,000 gallons per minute, requiring about 2.4 horse-power per foot lift, or, for 22 feet, say 53 horse power. Suction and discharge pipes 18 inches in diameter. The greatest capacity of an 18-inch pump quoted by makers is 22,000 gallons per minute, or over 13,000,000 gallons in a 10-hour day. At 45 per cent. efficiency of pump and pipe system this output will require 206 horse-power from engine, and a velocity of 650 revolution per minute for the pump. The suction pipe should be 24 inches in diameter and the force pipe 18 inches in diameter, with as few bends as possible, and such as are used should be of long radius. The efficiency of a centrifugal pump increases with its size.

The formula, according to Fink, for the diameter of the suction and discharge pipe of a centrifugal pump is:

$$d = 0.36 \sqrt{\frac{Q}{\sqrt{2g \times h}}}$$

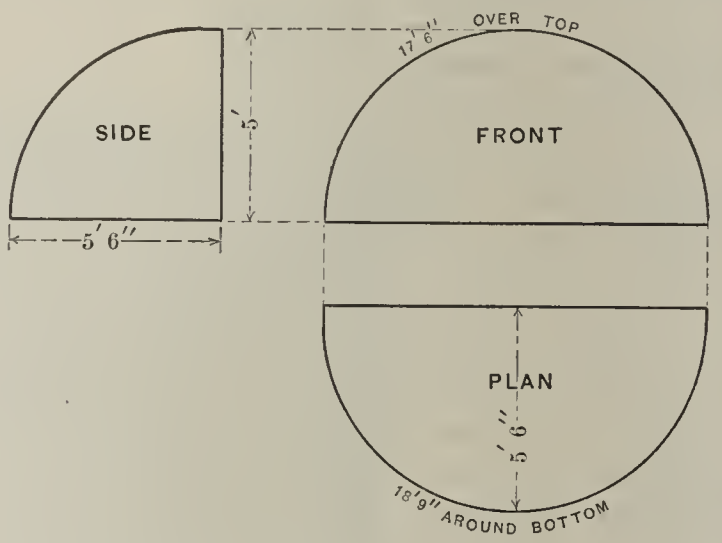
d = diameter of the pipe in feet.
0.36 = a coefficient.
Q = quantity of water in cubic feet.
$2g$ = twice gravity = 64.4.
h = the whole hight of discharge.

Then for the case of 1,000,000 gallons per hour = 2222 cubic feet per minute, at 22 feet hight, the equation figured will be $0.36 \sqrt{\frac{2222}{\sqrt{64.4 \times 22}}} = \sqrt{1416.8} = 37.63$, and $\frac{2222}{37.63} = 59$, and $\sqrt{59} = 7.68 \times 0.36 = 2.76$ feet, or say 33 inches, diameter of pipe. If the suction takes place on one side, or by a single pipe, the inside diameter of the wings should be 1.2 diameter of the pipe, or 39.6 inches; the outer diameter should be 2.4 d. or 79 inches. Its peripheral velocity should be $1.25 \sqrt{2g \times h}$, or $37.63 \times 1.25 = 47$ feet per second, or say 142 revolutions per minute. The efficiency of this, if constructed in the best form with peripheral areas equal to the area of the pipe, should have a power efficiency of over 50 per cent., and require nearly 200 horse-power to raise 1,000,000 gallons 22 feet high per hour.

Such a pump is recommended for a permanent plant for drainage purposes. For the convenience of intermittent work it should be located at as low a level as can be protected from accidental flooding.

A Roof Area Problem.

From A. T. S., New Jersey.—I would like to know how to figure the area of a roof of which I send a sketch. It is, as you will see, roughly speaking, a quarter of a



A Roof Area Problem—Fig 1.—Side, Front and Plan Views.

globe or sphere. Fig. 1 is a front, top and side view with the dimensions.

Answer.—The data given by the correspondent are not sufficient to make the calculations without assuming that the figure is a portion of a sphere. Making this assumption the problem is reduced to determining the radius of the sphere, the area of a quarter of a sphere and deduct-

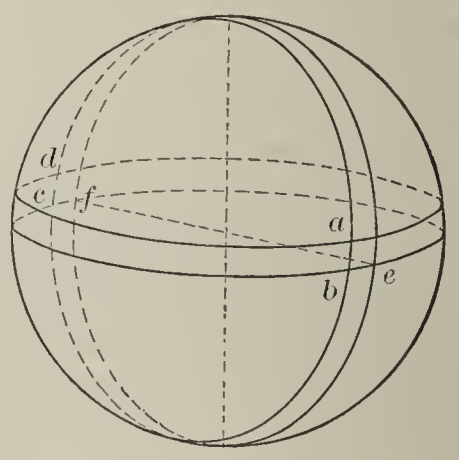


Fig. 2.—General View of Sphere.

ing therefrom the areas of the two portions of zones, Fig. 2, A B C D and E B C F, which we will consider as cylindrical in order to facilitate and simplify the calculation. The radii of the two circles whose arcs and versed sines are given are determined from the known relation of these three dimensions and are for the arc of 17½ feet 7.09 feet, and for the arc of 18¾ feet 6.92 feet. The radius of the sphere will be given by the expression, $R^2 = 6.92^2 - (R - 5)^2$; hence R = 7.3 feet.

The area of the one-quarter sphere will be $3.14 \times 7.3^2 = 167$.

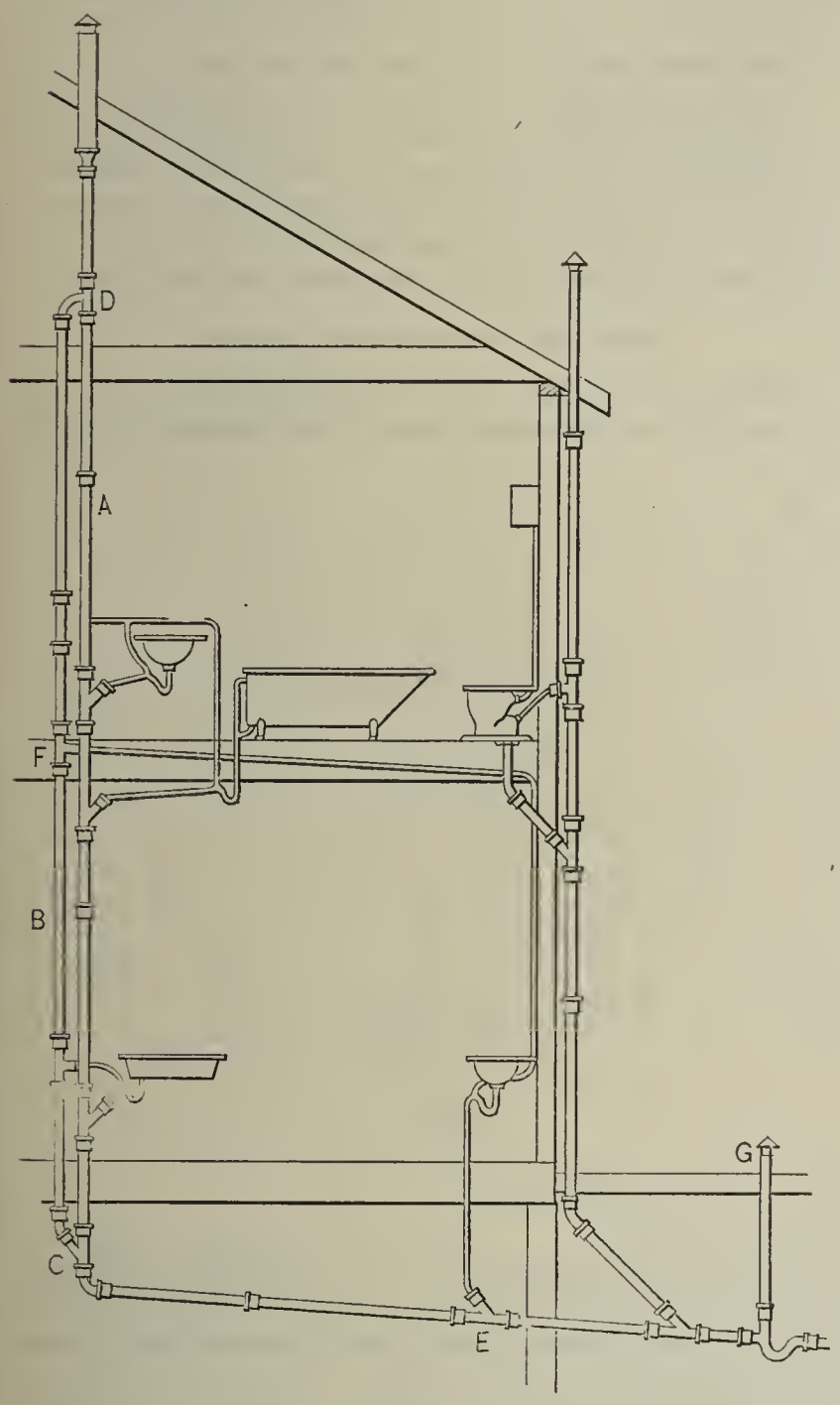
The area of the portion of zone $a\,b\,c\,d = (7.3 - 5) \times 18\frac{3}{4} = 43.25$.

The area of the portion of zone $e\,b\,c\,f = 3.14 \times 7.3\,(7.3 - 5.5) = 41.25$.

The sum of these two is equal to 84.50, which is the net area to be deducted from 167, and which leaves for the area of the roof in question 82.5 square feet.

A Defective Plumbing System Remedied.

From Oliver Twist.—The piece of plumbing shown in the sketch of "C. R.," Merced, Cal., in *The Metal Worker* of December 18, will be interesting to many readers. The features of locating the soil pipe stack upon the outside of the house is something that his brethren of a cooler climate never have the pleasure of doing. "C. R." is quite right when he claims that some parts of the work are insanitary. The bath overflow is bad, leaving a free passage of sewer gas into the room. The connection of the bath



A Defective Plumbing System Remedied

waste to the heel of the lead bend is not to be commended, and the placing of the main trap at the foot of the soil pipe stack is not very good practice. The sketch sent herewith is intended to show how the system might be brought nearer the standard called for by the plumbing regulations of most cities and yet be as near the original plan as possible. Keeping this in mind we find it necessary to vent all traps, using pipe of a size equal to the diameter of the waste, say for the bath 1¼ inches, basin 1¼ inches, sink 1½ inches and water closet trap 2 inches. Our vent stack, B, must be of suitable size to carry the combined areas of what we connect to it; in this case a 3-inch pipe would be a good size. We need a foot connection, C, to return any condensation in the vent to the waste. Our vent stack may run separately through the roof or may connect to the waste pipe above the highest fixture, which is done at D, and before going through the roof the pipe must be enlarged to at least 4 inches. By turning the bath around we are able to connect to waste stack instead of closet bend, and as there is no room for the trap above the floor we prefer to put it below the ceiling, where it is always accessible, connecting the overflow and vent as shown. This vent is carried above the top of the basin, so that in case of stoppage they would not act as waste pipes. The basin waste on the ground floor is connected with a ⅛ bend and Y branch at E, and is vented into a tee at F, but if preferred could be run into the soil pipe stack above the closet. The fresh air inlet G and trap would be better if kept 25 feet away from the house, and as the cap is removable any large objects stuck in the trap can be easily taken out through it. Turn to *The Metal Worker* of December 18 and notice the difference between the connections of the soil pipe with the sewer; the Y branch shown gives the sewerage a good deflection in the right direction, and the closet trap is vented through a 2-inch pipe into the soil pipe. The reason for enlarging the vent before passing through the roof is to prevent the outlet from being closed by frost, and is probably unnecessary in the balmy climate in which our friend "C. R." lives.

A Puzzling Case of Rusty Tin.

From H. T. D., Friendship, N. Y.—Please give me through *The Metal Worker* your opinion as to the cause of the rusting out of the gutter from which the inclosed sample was cut. This tin is one of the best known heavily coated terne plates. It was put onto our high school building two years ago, and was given a coat of paint. The tin where it was not rusty seemed to be well preserved and the paint was intact. The section that was rusted out lay in the bottom of the gutter. The right side of the inclosed sample was next to the boards and the rusty side was exposed to the atmosphere.

Note.—The sample sent us by our correspondent is a very disreputable looking piece of tin plate. It is corroded completely away in spots, and the greater part of the surface is affected by rust. He states in his letter that it was painted, but, if so, all traces of it were carefully removed from the sample sent us, which does not show any remains of a coating of this kind. As a matter of fact, tin laid in the position he speaks of ought to be coated once a year to keep it in the best condition. There are different possible explanations of the trouble in this case. One is that by some mistake a single sheet of poor tin got in among the lot, for there are some spots in the small piece that we have that look almost as if the sheet had been imperfectly cleaned of cinder, consequently it would not take the coating properly and would prove to have little durability. Another explanation is that the particular part of the gutter where the rusting occurred was a receptacle for leaves from adjoining trees, which collected in it and retained the dampness, which would be apt to corrode any metal near it. Furthermore, in the case of oak leaves—and we have heard it stated with alder leaves also—there is an acid brought out in the presence of moisture that has a very corrosive effect, and it would be difficult to get any plate to withstand the action. If our correspondent learns certainly what the cause of the trouble was, we should be glad to have him write us again

The Ferracute Machine Company of Bridgeton, N. J., are one of the firms who have kept busy during the dull times. They have gradually increased their force, and now are employing about 130 hands, and have recently enlarged their works. They shipped a short time ago to a firm in Ohio a press weighing 37,000 pounds, and which was about 8 feet long by 5 feet wide by 10 feet high. It was used with special dies for forming up conveyor troughs. The Ferracute Company have equipped their die shops with the most recent and improved machines, and have a large force of skilled workmen.

The Frank Kneeland Machine Company, Pittsburgh, Pa., have booked an order for the rolls for the new plant of the Old Meadow Rolling Mill Company, Scottdale, Pa. The Lloyd-Booth Company, Youngstown, Ohio, will furnish shears and lathes to the same concern and Lane & Bodley, Cincinnati, Ohio, a 36 x 60 Corliss engine.

SHEET METAL WORK.

Importance of Geometrical Drawing to Pattern Cutters.

BY GEO. W. KITTREDGE.

In replying to many of our correspondents who have requested solutions to pattern problems, *The Metal Worker* has had frequent occasion to refer to the necessity of a more thorough knowledge on the part of the pattern cutter of the principles of geometrical or linear drawing.

AN INQUIRY

of this class came to hand recently in which the correspondent desired to know how to develop the complete patterns of two double pieced elbows of which he inclosed sketches. Closing his inquiry he said: "How are the miter lines A B to be found, and how are the various pieces to be laid out so as to insure a perfect fit throughout?"

The usual correspondent simply asks how to obtain the patterns of this or that, but the above question: "How shall I obtain the miter lines?" implies the writer's inability as a draftsman. The inclosed sketches reproduced in Figs. 1 and 2 show what are really two cases of the

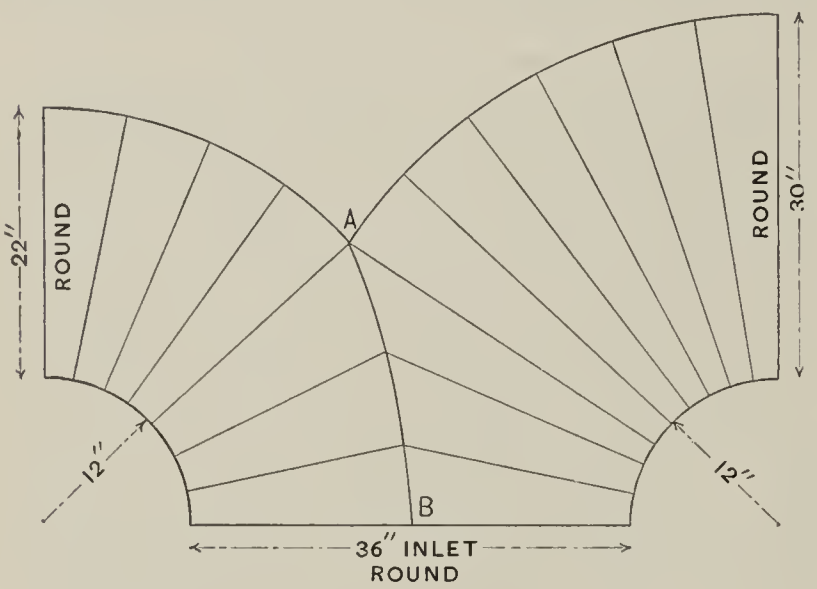


Fig. 1.

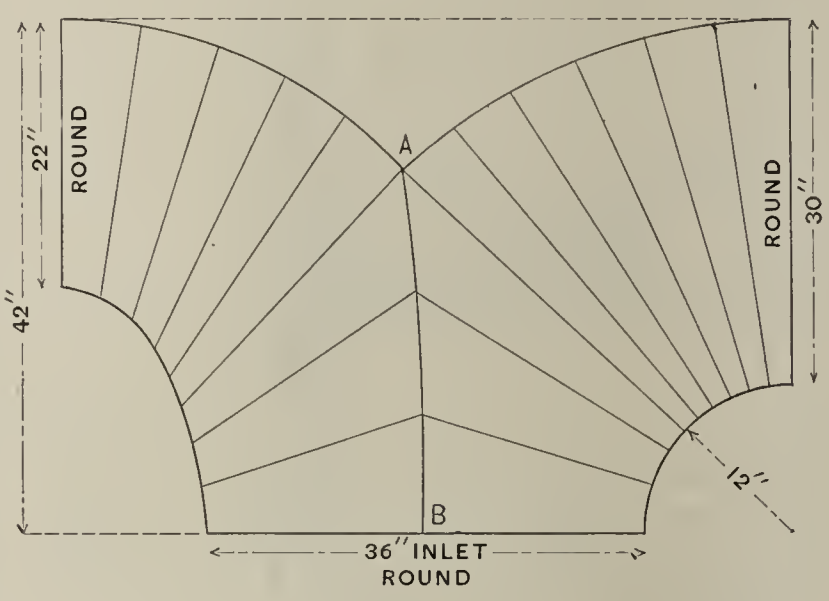


Fig. 2

Reproductions of Original Sketches Accompanying Inquiry.

same problem. In Fig. 1 the two smaller pipes are placed in the same horizontal line at the throat, while in Fig. 2 they are in line on the back. In either case the problem with which the correspondent has to wrestle is one of draftsmanship rather than of pattern cutting. With two carefully completed elevations and a plan of the desired elbows, as specified in either of the above sketches, at hand, no doubt any fairly intelligent pattern cutter would have little difficulty in working out the patterns.

We take the opportunity afforded by this inquiry of impressing upon the pattern cutter the necessity of familiarizing himself with the principles of geometrical drawing. Pattern cutting is simply an adaptation of the principles of linear drawing to the development of sheet metal forms. That particular branch of linear drawing with which the pattern cutter has to deal is properly termed orthographic or right line projection. In accordance with its principles all the points of any one view or elevation are determined with accuracy by means of parallel lines projected from one or more other views (elevations or plans).

Thus the draftsman begins the construction of his principal view from given specifications and proceeds to project therefrom as many other views as possible, or as he finds necessary to arrive at the results desired. In the evolution of such a set of elevations and plans new facts are often brought to light as the work progresses which were unknown at the outset, and which as soon as obtained render their share of assistance in obtaining the final results. Such a course, supplemented by the fund of knowledge which comes with experience on the part of the draftsman, will often accomplish wonders.

The above problem furnishes such an excellent opportunity of illustrating the application of the foregoing suggestions that we will undertake to describe the complete operation of constructing the necessary plans and elevations and of laying out the patterns for the above, as far as necessary, beginning with the conditions as given in Fig. 1.

BEGINNING THE PRINCIPAL VIEW.

First draw any horizontal line indefinitely, as C D of Fig. 3, upon which set off at convenience the distance E F equal to 36 inches, the desired diameter of the inlet. From the points E and F set off 12 inches in either direction upon the same line, thus locating the centers G and D, from which the throat curves are to be struck. Now erect perpendicular lines from the points G and D indefinitely. From G and D as centers, with a radius of 12 inches, describe arcs from E and F cutting the perpendiculars just drawn in the points M and K. From M and K set off respectively 22 inches and 30 inches upon the vertical lines, obtaining the points N and L. From D as center, with the radius D L, describe an arc, L A, indefinitely; and from G as center with G N as radius, describe another arc, cutting the first one in the point A. This completes the general outline of the side elevation.

Since three pipes of different diameters are to be joined, it is evident that there must be some gradations in the width of this elbow at the various points of its course.

OTHER VIEWS REQUIRED.

It will therefore be necessary to construct either a plan or an end view, or perhaps both, upon which to establish such gradations and to measure widths when necessary. The plan may be begun at once, and all of the views which it is deemed necessary to construct should so

far as possible be carried along together, all points in any one view being projected into the other views as soon as obtained. Since both halves of the elbow, when divided by a vertical longitudinal plane, are supposed to be alike, half of the plan or end view will be sufficient for all purposes. Therefore draw C¹ D¹ parallel to C D and at any convenient distance away, as the center line of a plan From each of the points G, E, F and D drop lines vertically, cutting C¹ D¹ at G¹, E¹, F¹ and D¹, and continue them indefinitely below. Bisect E¹ F¹, obtaining the point B¹, which will become the center from which to describe the semicircle E¹ H F¹, representing the half plan of the inlet or largest pipe.

DETERMINING THE MITER LINE BETWEEN THE ARMS.

In drawing the miter line or line representing the junction of the two arms of the elbow, as seen in the side view, and in determining the shape of the opening which it represents as it would appear if seen from either end, the pattern cutter will have to be guided by his general knowledge of intersections and the shapes derived therefrom. Were the two pipes of the same diameter throughout their course, and brought or mitered together in the general manner indicated in the drawing, the position of the miter line would result from the simple operation of bringing together two sets of lines emanating from corresponding points in their respective profiles. If, again, one pipe being larger than the other, both be continued without change of diameter as before through the several pieces composing the elbow, the position of the miter line upon which the two would intersect would be the result of a similar operation. But since the two branches or elbows are required to unite so as to form a third pipe of a specified larger diameter than either, the problem consists in the devising or designing of a transition composed of several pieces which shall begin at A with a junction of the two smaller pipes and finish at E F with a perfect circle representing the larger pipe.

In this part of the work the draftsman will have an opportunity to exercise the powers of his imagination in forming a mental idea of the approximate shapes of the several intermediate pieces necessary to accomplish the transition, working upon the supposition that if he can form an idea of the general shape and dimensions of the several parts he will have little difficulty in placing the different views of them upon paper.

CONSTRUCTION OF A MODEL.

In the failure of his powers of mental conception he could be materially aided in his work, should he care to take the trouble, by the construction of a model. An inspection of the drawing, as thus far constructed, will show at once that those portions of the branches from A to N and A to L will be the same as ordinary pieced elbows. Suppose now that these parts have been made in the usual way, and have been placed relatively in the positions which they are to occupy in the finished work. Let the constructor now cut out a disk of any material and place the same in the position shown by E F of Fig. 3, then, taking moist clay or molders' sand, proceed to fill in the space E P A Q F between the approaching ends of the elbows and the disk at the base, shaping it so as to meet the curves of the throats at either end and gradually reducing its width or thickness as it rises till it meets the circles at A P and A Q. A model so constructed will give the general shape of the transition, upon which the several pieces of which it is to be constructed must be so outlined tha they may be made by simply cutting and bending the metal.

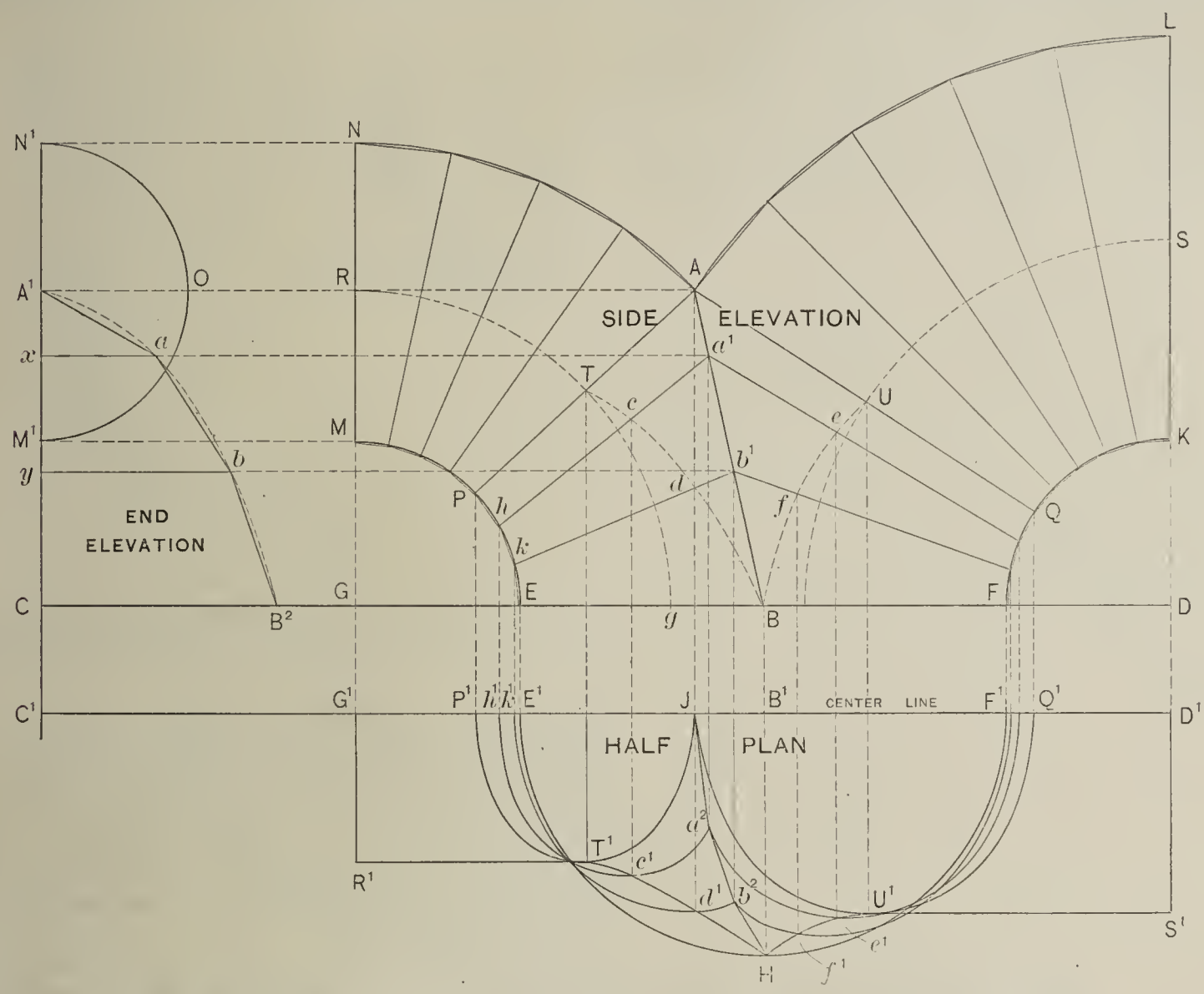


Fig. 3.—Completed Drawings of Double Elbow Shown in Fig. 1.—One-eighth Full Size.

METHOD OF PATTERN CUTTING TO BE EMPLOYED.

Sooner or later in the solution of every problem in sheet metal work the question of the method of developing the patterns arises. Is it a miter or miters between continuous or parallel forms? Are the pieces portions of regular tapering cones, or are they irregular tapering forms, in which case triangulation must be resorted to? An inspection of the drawing as thus far developed, or of the model if it has been constructed, will show that those parts constituting the transition must be developed by the methods of triangulation, and that therefore their outlines may be drawn arbitrarily in accordance with the judgment of the draftsman, provided that they are not so drawn as to involve hammering or stretching of the metal.

To proceed then with the drawing in the light of the above conclusions, the miter line A B may be drawn straight from A, the point of least or no width, to B, the point of greatest lateral diameter or width of the united elbows. To be sure, it might be drawn from A to a point to the right or to the left of B if there were any reason for so doing, or it might be drawn with a general curve composed of as many straight lines as there are intersecting pieces on either side, but such a course would only complicate matters to no purpose. The line A B, representing as it does the junction of two pipes while appearing straight in this view must necessarily have a profile when viewed from the end. An idea of the shape which it represents could be obtained by cutting away one portion of the model described above by means of a thin bladed knife or a wire held taut and passed from the point A down through to B, the middle of the disk at the base. To obtain this line without the aid of the model it will become necessary to construct an end view of the junction, as shown at the left in Fig. 3.

THE END VIEW.

Draw any vertical line, as C N^1, representing the center line of the proposed view. Project the point A upon this line by means of the dotted horizontal line, as shown at A^1, and from C set off on the horizontal base line one half the width of the largest pipe—that is, make C B^2 equal to 18 inches. A line drawn from A^1 to B^2 will then represent one-half the opening between the two branches of the elbow. This line, so far as the requirements of triangulation are concerned, might be drawn perfectly straight between the two points. But here the knowledge or experience of the draftsman must be called into play. Any one who has seen two straight pipes mitered together so as to form a Y, or has cut any oblique miter upon a cylinder, knows that the shape of the opening so produced is elliptical. It is therefore advisable that the line A^1 B^2 should approximate a quarter ellipse in shape, as shown by the dotted line in the end view.

This end view may be completed as far as desired, making it an elevation of the end nearest which it is drawn. Therefore project the points N and M horizontally from the side elevation to the center line of the end elevation, as shown at N^1 and M^1. Bisect the distance N^1 M^1, locating the point A^1, which by mere accident or coincidence falls at the point representing A of the side elevation. From A^1 as a center describe the semicircle N^1 O M^1, representing one-half the opening at N M to receive the 22-inch pipe. Lines from O toward B^2 may afterward be drawn to complete this view if found necessary.

DIVIDING THE ELBOWS INTO PIECES.

The next matter to be determined will be the number of pieces of which the elbows shall be made, and the drawing of the divisions upon the elevations in accordance with the same. The number of pieces will, of course, be determined in accordance with physical requirements; material to be conveyed, friction, &c. Having determined this, first draw lines from A toward G and D, as shown by A P and A Q. The portions A N M P and A L K Q thus become the equivalents of ordinary pieced

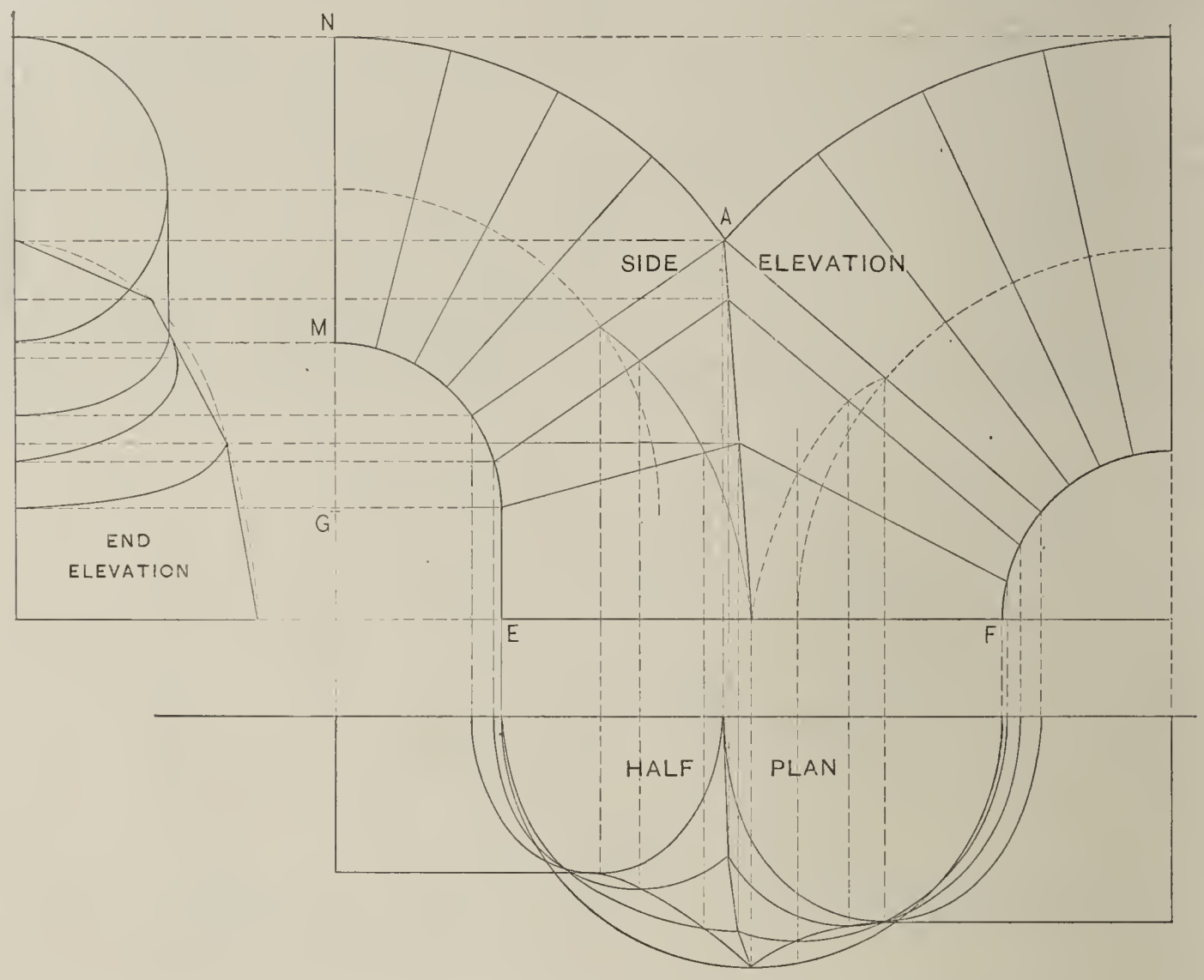


Fig. 4.—Completed Drawings of Double Elbow Shown in Fig. 2.—One-eighth Full Size.

elbows, and the arcs A N and A L being unequal, may each be so divided into equal spaces that the spaces in both shall be approximately alike. Thus it will be seen that if N A be divided into four equal spaces and A L into five, they will be nearly alike in both. From the points of division assumed in N A and A L lines may now be drawn toward G and D to the throat lines, as shown. Now connect adjacent points upon the arcs, both of the throats and the backs, by straight lines, thus completing these parts of the side elevation.

In continuing the division to the part forming the junction, the points of division corresponding to those already assumed on the backs of the pieces will have to be established upon the line A B; but as A B represents a curved line it will be better to fix the points of division upon its representative A^1 B^2 of the end elevation. Two points upon A B, dividing it into three spaces, will be found sufficient, since three equal spaces upon each of the remaining portions of the throat lines P E and Q F will result in an approximate equality of spaces in M E and K F respectively. Therefore the points *a* and *b* may be so taken upon the curved line A^1 B^2 that the space A^1 *a* will be the shortest and *b* B^2 the longest of the three. Connect the adjacent points by straight lines, as shown. By making the spaces shortest where the curve of A^1 B^2 is

quickest, or of shortest apparent radius, the resulting broken line will more nearly approach the curved line which it takes the place of than if the spaces had been made equal. The points a and b may now be projected upon the miter line A B of the side elevation, as shown at a^1 and b^1, and straight lines drawn from each to the corresponding points of division upon the arcs P E and Q F.

In the thus completed side elevation the two upper sections of the transition piece lying adjacent to the lines A P and A Q have the appearance of being no wider at their backs than at their throats, but a moment's reflection or a glance at the end elevation will show that the distance of the point a^1 from A is equal to a A^1 of the end view, and that it is therefore greater than the back width of any of the other pieces except those between it and the line E F. One might easily have made the mistake of dividing the line A B of the side elevation into three equal spaces had the end elevation, showing the shape of the section on A B, not been drawn. This liability to error is, in fact, shown in the crude outlines of the original sketches given in Figs. 1 and 2.

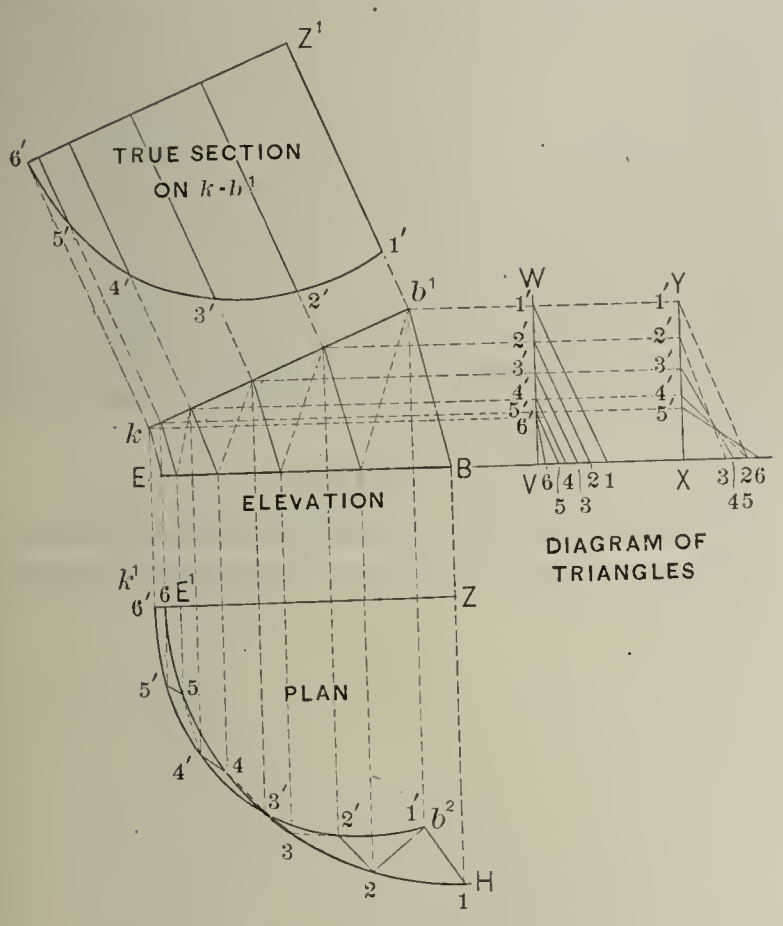


Fig 5.—Elevation, Plan and Section of First Piece, E k b^1 B, in Left Side, Duplicated from Fig. 3, Showing Method of Triangulation.

COMPLETION OF THE PLAN.

We may now turn our attention to the completion of the plan, upon which must be obtained a view of each of the several miter or joint lines between P A Q and E F, including the line A B. The positions of the points in A B upon the plan are obtained simply by projection and

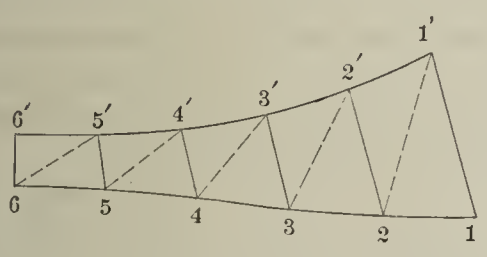


Fig 6.—Half Pattern of Piece Shown in Fig. 5.

measurement. The point A being upon the longitudinal center may be dropped at once to the center line of the plan, as shown at J. From each of the points a^1 and b^1 also drop lines to the center line, carrying them indefinitely beyond or below. Upon each of these lines respectively set off from the center line the distances a x and b y of the end elevation, as shown by a^2 and b^2. The point B being upon the circumference of the largest pipe may be dropped upon the semicircle representing the same in the plan, as shown at H. Connect the adjacent points obtained in this operation by straight lines; then the broken line J a^2 b^2 H will be the plan of the line A B of the elevation.

No further drawings will, of course, be necessary in obtaining the patterns of those portions between P A Q and the outlets. It will be advisable, however, to represent them in the plan on account of their relationship to the middle and more intricate portion. Therefore drop vertical lines from M and K through the center line of the plan, and make G^1 R^1 and D^1 S^1 respectively equal to the semidiameters of the outlets M N and K L. From R^1 and S^1 draw lines parallel to G^1 D^1 indefinitely toward the center of the plan.

The next operation will be to obtain upon the plan a projection of the circles P A and A Q. First bisect the lines representing those circles, as shown at T and U. Since T and U represent points of extreme projection or points of greatest transverse diameter, vertical lines may be dropped from them, cutting the lines drawn from R^1 and S^1, as shown at T^1 and U^1; also drop lines from P and Q cutting the center line of the plan at P^1 and Q^1. Then P^1, T^1 and J become three points of a semiellipse of which P^1 J is the minor axis; and likewise J, U^1 and Q^1 are three points of a semiellipse of which J Q^1 is the minor axis. These semiellipses may be drawn upon the plan by rak-

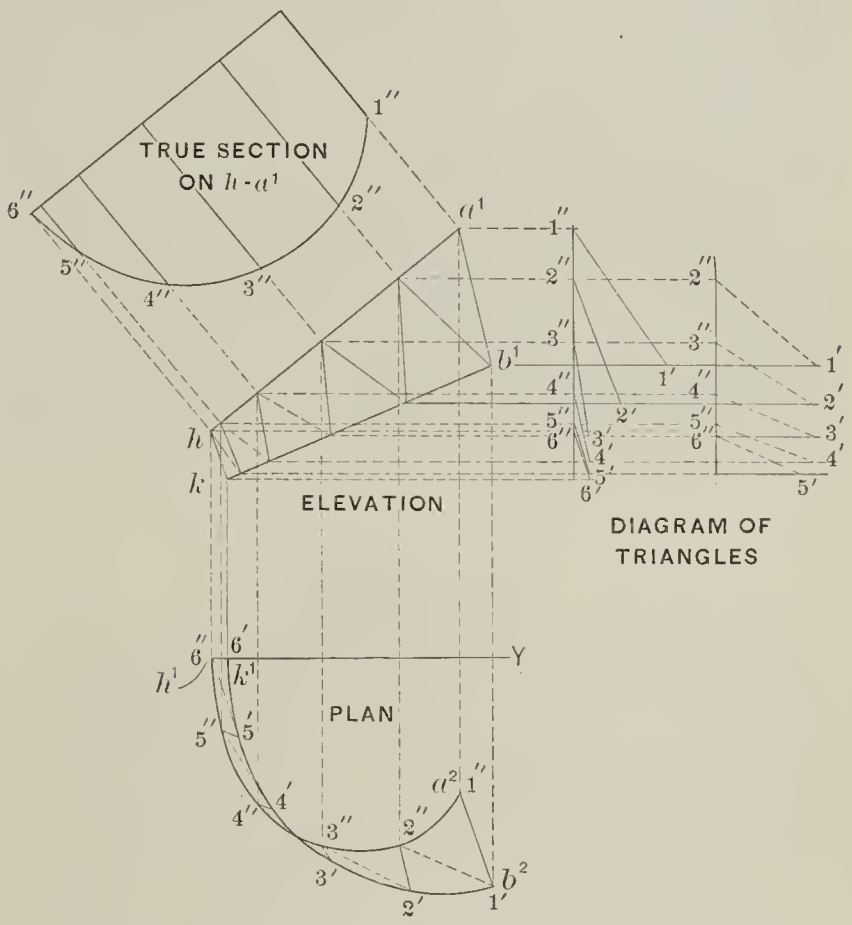


Fig 7.—Elevation, Plan and Section of Second Piece, k h a^1 b^1, in Left Side of Fig. 3, Showing Triangulation.

ing, by trammel or by any method most convenient which will result in true elliptical curves.

Having now drawn the plans of the circles constituting the upper and lower sections of the transition portion of the elbow, it remains to fix upon the plan the sections upon the two intermediate joint lines in each side or branch. Inasmuch as the method of triangulation admits of working to assumed outlines, the draftsman is here thrown upon his judgment as to the shape of and the best method of obtaining these sections. This can be accomplished by first establishing the principal points of the curves and then drawing them by eye so as to form in each branch a gradual transition from the circular profile of the small pipe to one-half the circle of the large pipe or inlet. The first points to be determined are those of greatest thickness or transverse diameter in each. The point of greatest transverse diameter in each of the joint lines in the smaller branch pipe is, of course, at the intersection of each with an arc drawn from G as center and with G R as radius, that of P A being at T. This arc continued intersects the line E F at g. But as the greatest transverse diameter of E F is at B the points c and d must

be assumed so as to deflect this line at T toward B. Having determined the points of greatest thickness upon these lines the question next arising is, What shall be the distance across the sections at these points? This must, of course, be determined upon the plan, where T^1 represents the point T, and H the point B. The most reasonable solution to the question seems to be to draw a line in continuation of $R^1 T^1$, curving it out to reach the point H. The line $R^1 T^1 H$ will then be a plan of R T B of the elevation. Lines dropped vertically from c and d of the elevation, intersecting this line at c^1 and d^1, will then locate the desired points in the plan. Next drop lines from h and k to the center line of the plan, as shown. Then h^1, c^1 and

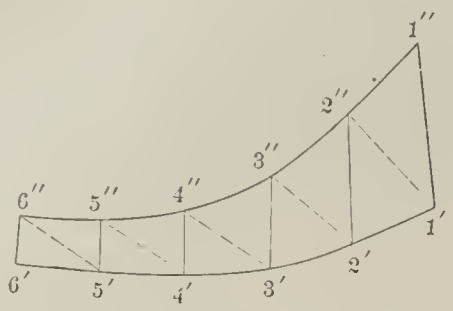


Fig 8.—Half Pattern of Piece Shown in Fig 7

a^2 are three points through which a curve, elliptical in character, must be drawn, establishing a plan of the line $h\ a^1$ of the elevation. In the same manner a like curve drawn through k^1, d^1 and b^2 will answer as a plan of the line $k\ b^1$.

The points and curves in the right half of the plan are obtained by a similar process, which is all shown by the lines of projection and the reference letters.

Should it be desired the projection of all the curves now shown in the plan could be obtained upon the end elevation by a process similar to that just gone through in obtaining the plan, simplified, however, by the fact that no questions of design can there arise, the position of all important points having been already established in drawing

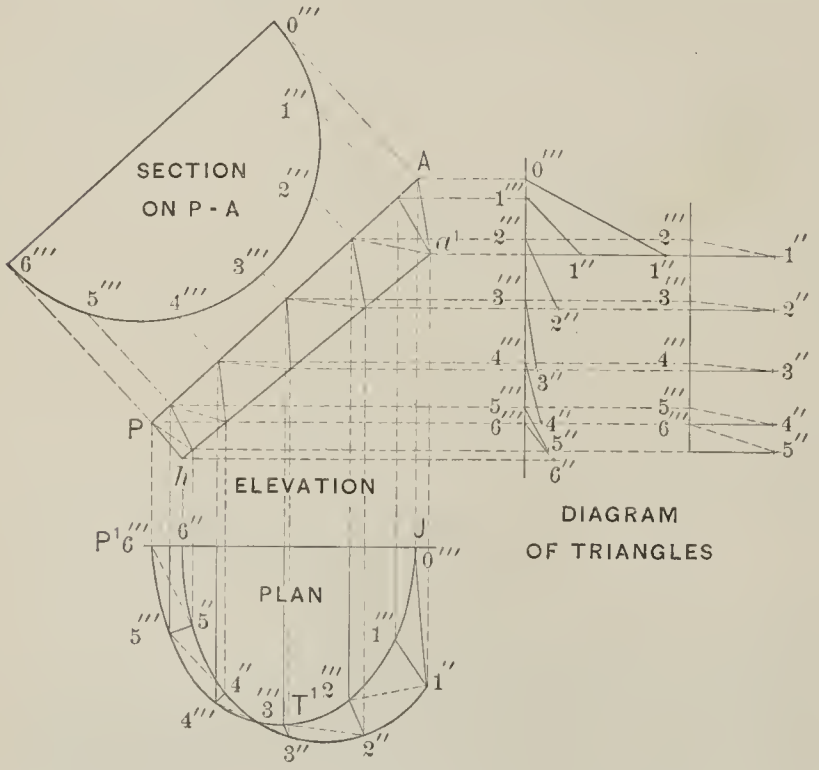


Fig 9.—Elevation, Plan and Sections of Third Piece, h P A a^1, in Left Side of Fig. 3, Showing Triangulation

the plan. Likewise the projections of the circles represented by the joint lines between A P and N M could be obtained upon both the plan and the end view by the method employed in obtaining the semiellipse P^1 T^1 J from the line P T A. These operations, however, would only be valuable as a lesson in drawing, as they are in no way necessary to obtaining the patterns.

In preparing drawings of our correspondent's second case, the original sketch of which is shown in Fig. 2, the methods employed in the foregoing demonstration are equally applicable. The completed drawings of the same are given in Fig. 4, in which corresponding points in the several views are connected by the lines of projection The conditions of the two cases are so nearly alike that the reader will have no difficulty in applying the demonstration given above to this case. The sketch shown in Fig. 2 differs from that in Fig. 1 principally in the fact that the two outlets are in line at the back, which gives a longer throat line to the smaller pipe than in the former case. While our correspondent has drawn this in his sketch somewhat elliptical, we have confined the throat proper to a quarter circle whose center is at G, Fig. 4, as in the former case, thence carrying the line vertically to the point E. This keeps that part of the elbow from A to N a regular pieced elbow, as in the former case, and simply modifies the shapes of those pieces lying between A and the line E F. Of course the throat line could be made a continuous curve from E to M if desired, but at the expense of much more labor in obtaining the final patterns.

The necessary drawings having been completed, it will be advisable before attempting to develop any of the patterns to make separate new drawings, each of which shall include the plan and elevation of one of the pieces, which shall be in all respects duplicates of the outlines already obtained, and placed conveniently near together, thus facilitating the subsequent operations by avoiding the confusion of lines which would result from performing them all upon the one elevation.

THE PATTERNS.

In Fig. 5 is shown a duplicate of the piece E $k\ b^1$ B of Fig. 3, there indicated by the same letters, below which is

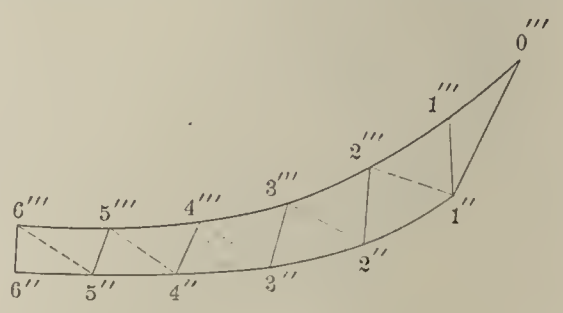


Fig. 10 —Half Pattern of Piece Shown in Fig. 9.

its plan traced from Fig. 3, in which E^1 H is a plan or true section on the line E B of the elevation, and $k^1\ b^2$ is a horizontal projection of the line $k\ b$ as traced from the line bearing the same letters in Fig. 3. Each of these curves constituting the plan of the piece may now be divided into the same number of equal spaces of convenient size, and numbered correspondingly, as shown by the small figures. Points of like number must be connected by solid lines, and the four sided figures thus produced must be subdivided diagonally by dotted lines, as shown. The triangulation thus produced may be seen to better advantage upon the elevation, the points upon the upper and lower bases being obtained in that view by projection from the corresponding points of the plan, all as shown by the vertical dotted lines.

The true lengths of the several solid and dotted lines thus obtained in both plan and elevation are to be obtained by the method usual in all similar operations—that is, by considering them as the hypotenuses of triangles whose altitudes are obtained from the elevation and whose bases are these lines as they appear on the plan. This operation is shown in the diagram of triangles at the right, in which the hights of the points in the vertical lines V W and X Y are obtained by projection from the elevation, while the horizontal distances between corresponding points are obtained by measurement from the plan; the hypotenuses being drawn give the true distances across the pattern, which is given in Fig. 6.

The lengths of the spaces upon the lower line of the pattern are obtained from E^1 H, the plan of the lower base of this piece. To obtain the lengths of the spaces upon the upper line of the pattern, however, a true section on $k\ b^1$ must be obtained as shown above, since it is evident that distances measured upon the oblique line are greater than the horizontal distances as given upon the plan. This section is obtained by the usual operation of raking from

the line of the upper base as given in the plan, viz.: Draw lines from each of the points in $k\ b^1$ at right angles to the same, intersecting the line 6′ Z^1 of the section which is drawn parallel to $k\ b^1$. The distances of the several points in the developed curve from the line 6′ Z^1 are the same as those of corresponding numbers in the plan from the line 6′ Z.

In Fig. 7 is shown the duplicate drawing of the second piece of the left portion of the elbow with its plan, diagram of triangles and the true section of its upper base. In drawing its plan, $k^1\ b^2$, the line of its lower base may be traced and transferred from Fig. 5, with its points as there used, instead of being obtained from the original plan. The true section obtained in Fig. 5 becomes the true profile of the lower base of this piece, therefore the stretchout of the lower side of its pattern, shown in Fig. 8, may be taken from the true section in Fig. 5. The points in $k^1\ b^2$ from which this section was derived are thus located at once in the plan in Fig. 7 by the transferring above alluded to and form the basis of the triangulation. The subsequent work of developing the pattern of this piece is exactly similar to that employed in obtaining the first piece.

In Figs. 9 and 10 are shown the necessary drawings and pattern of the third piece. The true section obtained in Fig. 7 becomes the true lower base of this piece, while the true upper base is a semicircle whose diameter is A P of Fig. 3. While the true projection of this semicircle in the plan, as shown by $P^1\ T^1\ J$ of Fig. 3, is according to geometrical rules a perfect semiellipse, it is better to obtain the same in Fig. 9 by the operation of raking, so dividing the same that the points and spaces used may also be used in connection with those of the lower base $h\ a^1$ for the purpose of triangulation. It will be noticed that one more space has been taken in the upper base of this piece than in the lower on account of its greater length, and that the triangles have been so arranged that the apexes of two come together at the point 1″. By this treatment the triangles so produced are more nearly equilateral, and can therefore be more accurately constructed in the operation of laying out the pattern than if they were very scalene.

TINSMITHING FIFTY YEARS AGO.

The article printed in *The Metal Worker* February 5, entitled "Tinsmithing Fifty Years Ago," and giving a New England list of day's work, has brought out the following letter from John Brett of Millington, Mich.:

I notice in *The Metal Worker* of February 5 an interesting account of the list of day's work for assorted tinware from a brother tinsmith, John D. Ottiwell, and it pleases me very much to hear from one of the old boys. I was an apprentice (a cub) in the fall of 1849 and served four years at the trade and then one year under instruction at coppersmithing. Now what brings out this communication is the wish to take a little exception to the list given by Mr. Ottiwell, or, rather, to show the difference in the lists as used in different parts of the country. We then, as piece workmen, worked what was called the "Yankee" list of day's work, as follows:

LIST OF STOCK COMPRISING A DAY'S WORK AT SEVENTY-FIVE CENTS PER DAY.

3 ovens, large, Dutch.
4 ovens, small, Dutch.
14 14-quart open pails called dish kettles.
20 10-quart open pails called dish kettles.
30 6-quart open pails called dish kettles.
12 10-quart covered pails.
16 6-quart covered pails.
20 3-quart covered pails.
24 2-quart covered pails.
24 2-quart saucepans.
20 10-quart pans if bottom was pieced.
24 10-quart pans with 12 x 12 tin for bottom.
36 6-quart pans.
48 2-quart pans.
48 3-pint basins.
72 1-pint basins.
20 large strainers.
24 small strainers.
16 1-gallon coffee pots. (Not sure about this.)
20 3-quart coffee pots.
80 large candle molds.
100 small candle molds.
20 punched lanterns.
8 square glass lanterns.
Elbows 50 cents a dozen.
Dripping pans 50 cents a dozen.
Boilers 50 cents a dozen.

We made everything with pit bottoms and out of 10 x 14 tin and straightened out our No. 7 wire. I have had 50 cents and 37½ cents each for tea kettles made with raised breast and cover. I have known the price of piece work to be at the rate of 67½ cents, about a day's work, and I have had 88 cents. The above is not complete, but some of the old boys will recognize it, and I should like to hear from some of them.

Employers' Association of Roofers and Sheet Metal Workers.

A call has been issued by President George Hayes and is being sent out by Secretary James R. McAfee for a meeting of the Employers' Association of Roofers and Sheet Metal Workers of Greater New York and adjacent cities, to be held at the rooms of the Building Trades Club in the Townsend Building, Twenty-fifth street and Broadway, on Friday evening, February 18, at 8 o'clock. It is expected that at this meeting the reorganization will be completed and the members will sign the roll and consummate their membership. Among the other business that will come up will be the election of a second vice-president and action on the report of the Committee on Constitution and By-laws. The nomination of the Executive Committee will be confirmed, and the articles of incorporation will be received. A full attendance of all who are interested in these trades is invited.

FLASHINGS.

The regular monthly meeting of the Iron and Steel Sheet Manufacturers' Association was held in the Conestoga Building, Pittsburgh, Pa., on Tuesday, February 8, with President J. G. Battelle of Piqua, Ohio, in the chair. There was quite a large representation, but nothing but routine business was transacted. The manufacturers referred to the present demand for Black Sheet as being quite heavy for the season and larger than for many years. Indications point to an exceptionally large volume of business in the next two or three months.

The Cleveland (Ohio) Union of Tin, Sheet Iron and Cornice Workers at a meeting last week voted to make a demand for a uniform scale of wages this spring. At present there is said to be no uniform scale of wages for these trades in force in Cleveland. Wages are at a rate of from 20 to 35 cents an hour on an eight-hour day basis. The eight-hour day is said, however, not to be very well maintained. The men have decided to demand that on the first Monday in April a uniform scale of wages shall go into effect in the city, with a minimum of 25 cents an hour, on an eight-hour day, and that for work overtime double pay be received.

Nimmo & Keech have succeeded to the business of W. C. Nimmo & Co., 32 South Calvert street, Baltimore, Md. The new firm are devoting their attention to Tin Plates, Roofers' and Tinsmiths' Supplies generally, and are now carrying a full lines of these goods.

The next meeting of the Western Foundrymen's Association will be held at the Great Northern Hotel, Chicago, at 7.30 p.m., Wednesday, February 16. A paper on "Mechanical Changes in Mixtures of Cast Iron," by Eugene W. Smith, will be presented. The paper read at the last meeting by Major Malcolm McDowell on "The Value of Metalloids in Cast Iron" created such interest that its further discussion was desired, and it will again come before this meeting.

Lucius Hart, for many years engaged in the metal business at Burling Slip, New York City, succeeding to the business established by his father, died suddenly on February 6, at the Hotel Vendome, New York.

HEATING AND PLUMBING.

A UNIFORM METHOD OF FIGURING.

When two men are figuring up the estimate of cost for doing a given piece of work it is not natural to suppose that one man can do it for one-third less than the other. Such a discrepancy in their figures is due rather to a lack of uniformity in the methods of figuring or a neglect on the part of the person who is making the figures to include all in his estimate that belongs there. A valuable lesson can be learned from the methods of computing cost adopted by the National Association of Stove Manufacturers. All who are members of the association calculate their cost in the same way on forms that have been decided by the association to be best adapted for the purpose. In some States also a well organized movement among the master plumbers has been made to secure a uniform method of figuring on plumbing contracts. The report from plumbers in those States is that their customers are securing a better class of work, a higher class of materials and the cost is not materially increased, while the plumber is receiving a profit on his work where heretofore it has been difficult to make both ends meet at the end of the year. It has been noticed by the trade that where these methods are in existence the plumbers are more prompt in meeting their bills.

Each year a number of new men enter into the various lines of trade, and many of them have had little previous training in mercantile business. They are equipped for the venture only with the practical information which they have gained in an apprenticeship of several years and in working as journeymen. The impression has existed in the minds of those who are already established in the trade that they were not called upon to educate these men in business methods, and as a result the trade generally has suffered from the new men making prices lower than they could really afford owing to their inexperience. It would seem to follow, therefore, that those tradesmen who work in unison, who work through builders' exchanges or other trade organizations should, as a matter of protection to themselves, bring to the notice of these new men the systems of figuring and the items of expense in carrying on business which they have found must be included in all the calculations of cost to make the business successful. If this is done the erratic methods of arriving at cost which contribute so much to the demoralization of trade would gradually be supplanted by better business methods, and when the prices are profitable the tradesman can afford to do for his customer a better class of work, and all interested would be benefited, from the manufacturer who sells the goods to the owner who finally uses them in his property.

Piping Old Houses for Acetylene Gas.

Since the discovery of acetylene a number of manufacturing companies in different cities and towns throughout the country have put apparatus for the generation of this gas on the market. These machines have been most popular in suburban and country districts where no artificial gas supply is available. In these places many of the houses, stores and other buildings have not been piped for gas, and the problem which confronts the suburban plumber and gas fitter is the piping of such houses without disfiguring them or making too much trouble for customers. It is necessary to pipe the house thoroughly without cutting the plaster. In many instances the walls are papered, and if the plaster were cut through it would be impossible to match the paper, or if the paper could be matched the difference in the color would disfigure the wall. In some cases sales have been lost from the fact that the labor of moving furniture and taking up carpets has been looked upon as too great, and that the advantage from the acetylene gas light would not be sufficient to pay for the trouble. To avoid cutting the plaster in the side walls some gas fitters have run polished brass pipes up from the floor to the point where a side light was necessary. In piping these old houses there is room for a considerable amount of skill to be displayed by the gas fitter in reaching the desired points without inconvenience to the householder.

This new demand for gas piping in old houses is, in fact, only a renewal of the problem that is met with in the introduction of gas from street mains in old towns. In many instances there has been no attempt to hide the gas pipes, and little attention has been paid to making their appearance pleasing. If exposed piping is used there is no reason why its appearance should not be pleasing to the eye. Brass pipe and fittings can be used, and having a high finish will be in keeping with the other furnishings even if their being in open sight may seem strange at first. It is claimed that the piping need not be so large in size for acetylene gas, which will be in its favor where it must be exposed.

English Practice in the Warming and Ventilation of Technical and Art Schools. *

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All will agree as to the positive necessity of thoroughly grappling with this question. It is not enough to have an inlet here and an outlet there and trust to natural ventilation. The authorities are now becoming alive to the fact that they can ask (and expect to obtain) that a definite temperature be maintained and that a certain volume of air shall be propelled into and out of the various rooms.

In the chemical department of science schools not only the vitiation of the air from the congregation of many people in one room, but also the noxious smells caused by the various experiments, have to be taken care of.

The system which best fulfills the requirements is a mechanical one, and is a combination of the plenum and vacuum systems. The whole of the fresh air required for the building is preferably taken from four sides of an independent tower, so that whichever way the wind is blowing the effect of the wind shall be the same; also, air taken in at such a point is less liable to contamination.

It is often difficult, however, to separate the air inlet from the main building; it may then be treated as an offset from a main wall, with openings in three sides, or again, a tower may be put up in connection with a lower part of the building and the air drawn down it. A very excellent air inlet was found in connection with an apparatus erected by Mr. Sylvester years ago at the Mickleover County Asylum, and which apparatus has since been turned into a mechanical system with very marked success. On the top of a tower, say 30 feet high, a cowl is fixed which moves round so that its mouth always faces the wind.

The fresh air on being drawn down the intake enters a large chamber, the sectional area of which should be at least three times greater than the area of the inlet shaft. The object of thus opening out the space is to form a settling chamber for the particles of dust in the air, and also to obtain a large area of filtering material. Across this chamber the screen is fixed, which is formed of a rough open material, cocoa fiber, or jute. In connection with the screen a long brush is fixed, which is balanced and fitted with two handles, so that it can be readily drawn up and down the filtering material. The use of this brush is twofold: 1, By drawing it up and down a few times the dust particles are brushed off the screen; 2, the water is made to spread equally over all the

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filtering surface. Patents have recently been taken out for moving the brush very slowly up and down the screen by power, and also for very slowly revolving the filtering material, as the same time passing it through a bath of water, which, for some purposes, may be conveniently charged with a solution of disinfecting material. A supply of water is provided for the screen from an automatic flushing tank, which can be regulated to discharge its contents at stated periods as found necessary, according to the weather. In dry, dusty weather the screen is always kept damp. Easy access is arranged to both sides of the screen. Care is taken in arranging to take away the waste water that there is no connection with the drainage system. The fan is fixed on a wall parallel with the screen. It is thus equally fed with air, and, as a consequence, runs with less power and less vibration or noise. As to the mode of driving the fan, by far the greater number of fans are driven by gas engines, and they are, no doubt, economical and convenient, but they cannot be said to be the ideal means of driving fans for the plenum system, for three reasons: 1, Irregular running; 2, nuisance from smell, and 3, noise.

The third is a serious difficulty, as unless great care is taken there is sure to be some noise. The fan is always driven on the delivery side, so that the pressure of air through the belt race will be into the gas engine room, whereas, if driven on the suction side, the smell would be drawn in by the fan.

In some technical schools a steam engine is required for experimental or other purposes, and high pressure steam has to be carried on the boiler; in that case all the exhaust steam from the engines can be used in the winter time for warming the building. But the ideal driver for a fan is the electric motor, which is coming more and more into use; it is perfectly regular, under immediate control, the regulation of the speed being simple within certain and sufficient limits; perfectly noiseless and free from smell, and though not so economical as the steam or gas engine is, for the small power required and advantages in other ways, an economical machine.

The question of electric lighting and the power for same in large institutions is very cloely allied to the warming and ventilating question, as in cases where the light is generated on the spot the whole building may be warmed and supplied with hot water with the exhaust from the engines. This is being most effectively done, especially for asylums and large kindred buildings.

Low pressure steam for buildings of such a size as technical schools has established its claim as the simplest and most economical means of getting the necessary heat. A boiler or boilers, according to the size of the building, is fixed preferably 6 to 8 feet below the level of the fan chamber. If it is possible to put the boiler down at the level above indicated a "gravity return" arrangement of pipes to the different batteries hereinafter mentioned may be secured. On this plan all the water of condensation from the batteries and pipes will automatically return to the boiler, and little or no waste of water will result. It is often impossible, owing to the nature of the ground, or the position of drains, to put the boiler house down to so low a level as has been indicated; in that case a very efficient and reliable mode of returning the water of condensation may be used, viz.: In the engine or motor room, 2 feet below the level of main trunk, is fixed an automatic return water pumping apparatus consisting of a steam tight vessel, called the "receiver," 5 feet long, 2 feet in diameter, to which is attached a small duplex pump. The return pipe from the heating system is connected to the top of the receiver; the pump draws the hot water from the receiver, forcing it into the boiler, so that no water whatever is wasted. Within the receiver is a float which is in communication with the steam supply to the pump. As the water rises or falls in the receiver the steam to the pump is turned on or off, the water in the receiver being thus automatically returned to the boiler. The pump can be operated either by steam from the boiler or by a belt from the power shaft.

From the delivery side of the fan a main trunk is formed in fair brick work with struck joints, so as to catch as little dust as possible, the trunk being not less than 6 feet to 6 feet 6 inches high, and in width proportionate to the amount of air to be passed. There are no projections to impede the current of air, and all corners are rounded. It is preferable to arrange for the fan to deliver the air in a straight line under the building, or it is often convenient for the trunk to make a circuit around the building. Chambers formed in brick work are taken off the main trunk to receive the heating surface, from which vertical flues ascend in the walls to the various rooms. These vertical flues are formed in the brick work and are made as smooth as possible. It is an admirable plan to build them in glazed brick work so as to reduce friction to a minimum and prevent any possibility of dust accumulation, though the possibility of retaining any dust in a vertical flue is not great, yet too great care cannot be taken to keep everything in the plenum side of the apparatus clean and sweet, as it represents the lungs of the whole building. The trunk should also be lighted.

From a stop valve on the boiler a pipe is carried into the main trunk and run the whole length or circuit, as the case may be, gradually getting smaller as the branches are taken off to the various batteries; the pipe is run at the highest level and arranged with fixed points for draining the condensed water into the return, and also, where necessary, provision is made to take up the expansion. The main return pipe is run in much the same way, gradually getting larger as it approaches the boiler and as branches come into it from the batteries. This pipe is run as close to the floor as convenient, and is connected up to a non-return valve in the boiler or to a connection on the receiver before mentioned.

It will have been noticed that no warming of the air has been done up to this point except that which is due to the main steam and return pipes. All the warming is done in chambers directly under the vertical flues rising to the various rooms.

It may be well to point out here that the principle of this system is very different to that of warming the air at a central battery near the fan and blowing the air along small ducts as a high speed, or even of that where the air is moved at a slow speed in large trunks, but partially warmed at a central battery and extra warming and control of temperature done by small batteries at the base of the vertical flues. The nearer the heating surface can be placed to the space to be warmed the better and more economical results in coal consumption will accrue.

Owing to the necessity of having such large trunks to allow access for cleaning and inspection, and also to pass the necessary quantity of air at a slow speed, the cooling or condensing surface is very great, a strong point against warming the air before it enters the trunk; again, by having the main trunk as the cold air supply any particular room can be cooled in a few minutes and a simple mode of regulating the temperature of any room to the greatest nicety can be employed, as hereinafter explained, without in any way altering the volume of air supplied. Every one is aware of the influence which the position of a room and state of the wind has upon its temperature; the plan of dividing the batteries of heating surface to take groups of rooms gives every opportunity for control of temperature by air mixing, but, more than that, by arranging the batteries with steam valves only so much of the battery as is required to warm the rooms need be filled with steam, and thus fuel may be saved. The battery chamber in which the air is dealt with before it ascends the flues into the various rooms is formed in two chambers, hot and cold, divided by a concrete slab. In the upper part of this chamber the heating surface is fixed, made of hollow cast iron sections with gills cast on. These are bolted together in rows, arranged in such a way that they are readily disconnected and drawn out for cleaning. The several rows are connected together by an arrangement of a header valve, which gives steam to either two or three rows, according to the regulation required. The valve is arranged in such a way that only one connection with the main steam pipe is required at the front end, the water of condensation flowing into the return pipe through the same connection. This is an exceedingly simple and effective fitting and works admirably. An air valve is fixed on each row of sections. The bottom half of the chamber is the cold part. The vertical flues start out of the cold chamber and also have an opening from the hot air chamber. Across the flue at this level a shutter valve is fixed, which either shuts off the warm air, allowing cold air to pass up into the rooms, or shuts off the cold air, allowing all warmed air to pass up the flues. Intermediate positions of the shutter give a mixture of the warm and cold air. By means of this shutter, then, any grade of temperature, within certain limits, can be obtained in any particular room, independent of any other, and this by actuating the one shutter. It is advisable that a damper be fixed at the base of each flue to shut off the air from rooms not in use or to regulate the amount to the various rooms.

For cleaning or repairs access to the chambers can be obtained through doors which are provided. Where a school or building is large enough to require the constant attendance of a caretaker the regulation is put into his hands, telephone connection being made from the various departments to the engine or motor room; but where the school is a small one and the caretaker has other duties which take him away from the apparatus for long periods the regulation of the shutter is effected from the rooms. It has been found from practical experience that the former plan is the most effective, and the best results are obtained from the apparatus. Where the question of expense is not one of grave consideration thermometers fixed in the rooms, but registering the temperature in the main trunk, are used very effectively.

Having fully considered the means of obtaining a supply of air and also the means of warming it and its regulation, the question now comes as to its introduction to the various rooms. The air is introduced 9 feet from the floor, with a maximum velocity of 7 feet per second, 5 feet, however, being preferable. So far as is practicable the air is passed into the rooms on the warm side, the

point of extraction being on the same wall at the floor level. In the case of a long room two inlets are used, one at each corner, with one outlet in the center. The same flue in different parts of its length is used for supply to one story and as a discharge from another above, the two parts being carefully separated. On no account is one flue section used to deliver air into two rooms, but in extreme cases the discharge flues are not so perfectly separated throughout their entire length. The discharge flues are arranged to extract from about the floor level as well as at the ceiling level. A shutter is provided at the ceiling opening which allows the discharge from the top or bottom of the room, or partly from both, but in no case can the opening be shut. The apportioning of the flue areas to each room is based on the air supply required for the maximum number of occupants and their work. The apportioning of the flue areas to each room is based on the air supply required for the maximum number of occupants and their work. For reasons of policy, rather than to satisfy hygienic requirements, the amount of air per occupant is fixed at not less than 1500 cubic feet per hour per occupant for lecture theatres, art school rooms, mechanics' shops, &c.; for chemical laboratories, 3000, and organic chemical laboratories, 4000, if possible. The flue areas are computed for an air flow of from 5 to 7 feet per second.

As far as possible it is considered advisable to conduct the extraction flues from the point where they terminate in the roof to a central tower of such a hight that its action shall not be dominated by any other building. Care is taken that the sum of the areas of the outlet openings on two sides of the tower equals the area of the cross section of the shaft. In cases where it is not possible to get a high extraction tower, or where a considerable length of horizontal trunking is necessary in roof, back flaps of a light material are fixed so as to avoid all possibility of back draft by reason of temporary or excessive wind action, or the disturbance of the system's action by the stopping of the fan, opening of windows, &c.

On no account whatever is connection permitted between the extraction from the chemical department and the general extraction from the rest of the school. The great aim in designing the extraction from this department is to prevent the possibility of smell and fumes getting into the other departments of the school. The following plan has proved perfectly satisfactory: At a convenient position in the roof space a chamber of brick or wood, well tarred, is formed. A fan, say 24 to 30 inches in diameter, according to the amount of air and fumes to be extracted, is fixed with a vertical or horizontal shaft, as is most convenient structurally, the air extracted by the fan being blown into the outer air through a dormer or tower. The fan is, as far as possible, constructed of copper and driven by an electric motor placed outside the chamber on the suction side. The means of starting and stopping the fan is operated from the room of the head of the chemical department. All extraction flues from the chemical department are carried into the fan chamber above mentioned. The areas of the openings from the chemical rooms are in excess of the areas of the inlet flues from the plenum system, so that by proportioning the flues this way there will be a slight pull into the room when a door is opened, which would not be the case without the fan and if the extraction flues were of equal area. A good rule is to proportion the extraction flues through the draft closets and tables, so that their combined area will equal the combined area of the inlet flues from the plenum, and to provide, besides, extraction flues in the walls whose combined area is equal to half the area of the inlet flues. Thus, in the event of some of the draft closets being closed, an increase of extraction area over inlet will still be maintained. In the chemical department it is wise to arrange for the ordinary extraction (as in the cases of other departments) for top and bottom extraction, and, besides, fit each extraction opening with a shutter to regulate or wholly close it if desired. If one large extraction flue can be arranged to take the benches, draft closets, and deal with the ordinary ventilation as well, an excellent result is obtained, a direct opening into the flue from the top and bottom of a room being made, which should be fitted with a valve for regulation. As it is necessary to run flues from the tables, which are in the center of the room, the floor is made deep enough to take a main extraction trunk formed of glazed earthenware trough covered with glass into which the small flues from the tables and draft closets run at an angle in the direction of the air current; this main trunk may be graduated according to the number and size of flues taken into it. Its area, however, due to being horizontal, is in excess of the sum of all the small flues. In some cases it is convenient, instend of running this main trunk under the floor and up the wall in one vertical flue, to divide it into two or more, one down each side of the room and running up the wall in two flues. These vertical flues are of earthenware, the square section used being more convenient for constructional purposes than a round one. The vertical flues on reaching the roof are carried into the fan chamber before mentioned, care being taken that the areas are not reduced at any point. The ordinary extraction from the room is taken up directly to the roof and connected to the fan chamber.

There are several arrangements for draft closets, those at the Medical School, Leeds, Leigh Technical School, and the Rutherford College, Newcastle-on-Tyne, all being good. The arrangement at the Massachusetts Institute of Technology, in Boston, however, commends itself as being admirable and to thoroughly meet all requirements. The following is a description of the arrangement by Professor Woodridge: "Within the hood is an inclined diaphragm of such width and placing as to leave a slot 3 inches wide along the whole front of the hood. Its location and inclination serve to protect the hood contents from injury by the falling of *débris* from the flue. The hood sash is prevented by stops from being raised beyond a fixed point, such that its lower edge shall be, according to the hight and temperature of the hood, from 4 to 8 inches below the outer edge of the diaphragm. The space between the glass of the sash and the face of the hood is cut off from the hood space by raised sash, so preventing escape into the room of gases, &c., by that means. The use of the diaphragm is apparent in extending and equalizing the current along the entire length of the hood. The direction of inclination given to it and the front location of the slot may not, however, be so apparently reasonable. The aim in the latter arrangement is to concentrate the discharge current along the line of most natural escape of warmed gases from the hood into the room, since all gases to escape must pass this line, which would not be true of a similar slot at the rear of the hood. The inclination given to the diaphragm is slightly upward from rear to front, that the initial upward movement may not be completely and abruptly broken, so forming a deep stratum of fumes which might then escape at the lower part, because beyond the reach of the effective action of the discharge current, or else might cool and settle or be forced down along the rear walls at a point remote from the heating burner, and so escape."

The warming of entrance hall, corridors and lavatories is done by direct radiation, fed by a steam main separate from the main which serves the batteries, as it is convenient and advisable when the school is not occupied to keep the place aired and free from freezing of the pipes in the lavatories.

In the case of board schools the question of warming

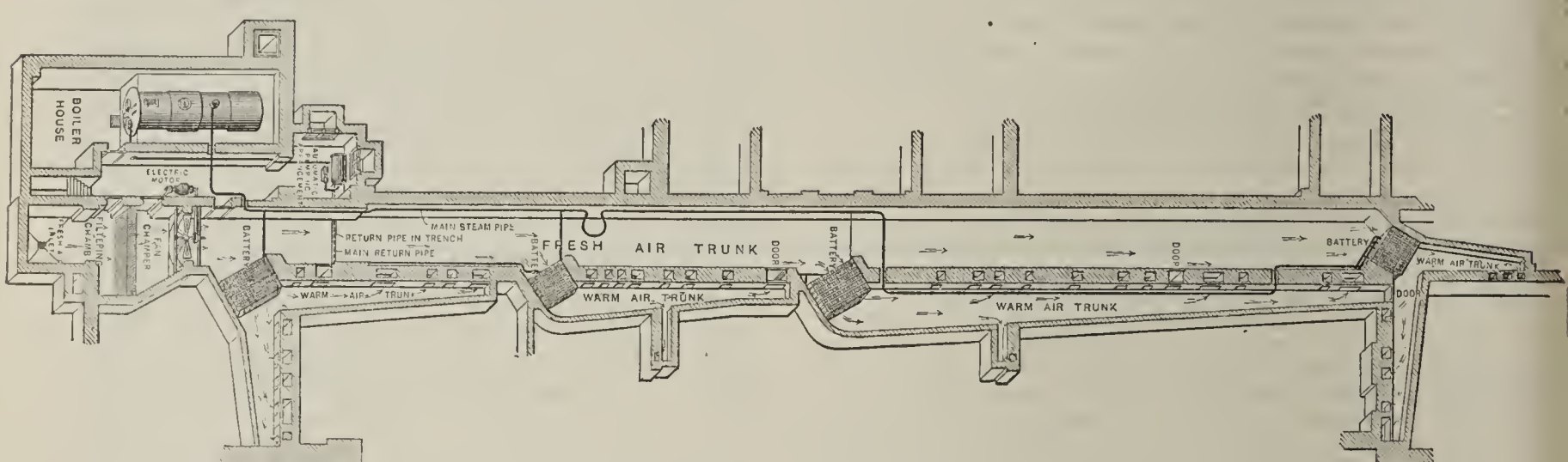


FIG. I.—ISOMETRICAL PLAN VIEW OF BASEMENT OF LEICESTER TECHNICAL SCHOOL, SHOWING POSITIONS OF BOILER, PUMP, FAN, BATTERIES, FLUES, ETC.

and ventilating the assembly halls is one that needs special treatment and may be incidentally mentioned here. Owing to the large cubic space for the number of children, except when used for assembling, some direct radiation is placed in the room. In this way the room may be warmed without the aid of the fan and without displacing the large amount of cool air with warmed air from the plenum, a feature of great convenience, it then being possible to warm the room for Sunday or other purposes, when it is inconvenient to run the plenum system. The radiators are supplied with air from the plenum, so that even when the fan is not running they draw in a fair quantity of air. When the fan is running sufficient air supply is allowed to give each child, say, 1000 cubic feet per hour.

For art schools there is sometimes furnished a conservatory that requires warming, which may be done by hot water circulation, the water being warmed in a heater, within which is a steam coil, the flow and return pipes being taken from the heater in the usual way. As the conservatory usually requires some heat when the main heating apparatus is out of use and the boiler is not required for any other purpose than warming, it is convenient to put in a little separate gas heating boiler for the conservatory.

Having dealt with and described a typical system for warming and ventilating a technical and art school, a few words may be said as to the theory of the methods here adopted. This may especially be the case in view of the somewhat frequent challenging of the reasonableness of one of the methods—viz., the system of downward ventilation—and the confusion of ideas, if not ignornace of the facts, which have in some instances marked the discussion of this part of the subject. Experience and careful observation have made clear the fact that the amount of air required in schools and other crowded rooms to keep the atmosphere reasonably pure must be determined by the number of persons to whom the air is supplied, and that the maximum seating capacity must be the basis. This is the only sound scientific ground from which to start, for it will support all cases, from those in which a large gathering of people is the only source to be allowed for to one where the number of persons present bears only a small proportion to the special causes of impurity. Let us take as an example a class room 26 x 25 x 15 feet, holding 60 pupils. To calculate the amount of air required it is necessary to know how much air each pupil will vitiate, and fix on a standard of purity. For all practical purposes the amount of CO_2 (carbon dioxide) is sufficient as a test of the purity or impurity of the air of a room, as the organic matter and micro organisms in the ordinary case follow the amount of CO_2.

In a town, from which source the air supply for the school has to be obtained, the amount of CO_2 contained is four parts in 10,000. An adult in health emits 6 cubic feet of CO_2 per hour; this is equal to six parts in 10,000, making, with the four parts contained in the fresh air, ten parts in 10,000. The question now comes as to how much fresh air is required to dilute the above to bring it down to contain such an amount of CO_2, &c., as will make it healthy to breathe.

Dr. Parkes places the standard of purity at six parts in 10,000, 4000 cubic feet of air per occupant per hour being required to bring it to this standard. It is generally accepted, however, that if the standard of purity can be maintained at seven or eight parts of CO_2 in 10,000 a satisfactory result is obtained. To obtain this result about 2000 cubic feet per occupant per hour must be allowed. The room above mentioned contains 10,000 cubic feet; therefore, taking the amount of air per occupant at 2000 $\times$ 60, then 120,000 cubic feet is the amount of fresh air required per hour to keep the room comparatively sweet; thus a total change of air of the room is required 12 times in the hour. If only 30 students occupied the room the change would then be six times per hour, but in all cases the calculations should be made and the size of flues fixed for the largest number of occupants likely to use the room. The area of inlet and outlet flues to give the above results would require, allowing a velocity of air travel of 6 feet per second, just over 6 square feet for 60 students, and if for only 30 students, 3 square feet. Now the question to be solved is as to how this large amount of air is to be introduced and withdrawn without unpleasant drafts, so as to give the best diffusion, and this brings us to the question of the position of the air inlet and outlet. The movement of air through a room for the purpose of ventilation should be in one mass and of uniformity in direction and in velocity. If the incoming air can be given such movement the vitiation will keep increasing from the inlet to the outlet, the quantity of vitiated air in the room will be reduced to a minimum and also the time of its retention and the limit of space occupied by it.

In the case of the top entrance of the warm air at 8 to 9 feet high, the action fulfills all the points laid down in the last paragraph. The air in entering rises to the ceiling, diffusing as it approaches the cooler outside wall and window; it then begins to descend slowly and uniformly to the floor and is drawn off by the extraction flue at the floor level. Again, the warm air has by this means of introduction an opportunity of losing some of its heat by contact with the cooler walls and windows before it is inhaled, instead of being breathed at its highest temperature. Again, the warm fresh air admitted above the heads of the occupants is made to circulate throughout the room before it reaches the outlet; there is a constant movement and mixing of the air, a perfect diffusion, and the fresh warm air is brought to the face to be breathed before it sweeps the body. It will thus be seen how important it is, if the best results are to be obtained, that the inlets and outlets should be properly located. In laying down a rule as to the positions of the inlet and outlet in technical schools, as in every other building, all the special conditions must be taken into account, and there are cases, no doubt, where the inlet and outlet may require to be placed in positions other than those indicated. This especially applies in cases where gas is used and special vitiation other than that from the occupants takes place. Now that gas is being so universally displaced by electric light in technical schools, special provision for the vitiation from gas need hardly be considered.

The plenum system has many points of advantage when compared with others in which the heating surface is placed within the rooms to be warmed, and in which the fresh air is introduced directly into the rooms, or through the heating surface. They may be summarized as follows:

1. No heating surface in the rooms; therefore no useful space occupied.

2. With direct radiation, if sufficient heating surface for the coldest weather is fixed in the rooms, then in moderate weather the rooms are overheated, whereas with the plenum system at least three grades of temperature can be secured in the arrangement of the heating surface without any complication, besides which the air mixing is another means of control of the temperature.

3. No risk of freezing, which is a frequent cause of trouble with the ventilating or direct-indirect radiator, especially when hot water is used and the air supply has not been shut off during the night.

4. With a careful and intelligent attendant no more fuel is used than with an ordinary heating apparatus.

5. Owing to the air being introduced at one place and there cleansed, the amount of dust is found to be much less with buildings fitted with a plenum system. Experience in buildings where the system has been at work over three years points to the fact that less cleaning and painting is required than with other systems in which the air is introduced all over the building.

6. In summer it has been found that the rooms can be kept cooler with this system, due to the cool walls of the trunk reducing the temperature of the inflowing air.

7. All pipes and heating surface being fixed in the trunk, no cutting about the building is necessary, and in case of repairs they can be readily got at without entering the rooms.

8. The question of first cost is undoubtedly a most important one, and no discussion of the subject would be complete without the matter being mentioned When comparing the cost of two different modes of warming and ventilating the same building great care must be taken to place the two schemes on the same basis as to the purity of air supplied, the quantity, the regularity, the convenience of working, &c. If this is not done the results obtained will be utterly useless and misleading; but whenever this is done and all the circumstances taken into account, the extra cost of the plenum is a very moderate amount. As far as the actual apparatus is concerned, it has been found from estimating certain buildings that the plenum costs considerably less than a radiator scheme on the same basis with equally efficient extraction, but the extra cost of builders' work in forming trunks more than covers this. Surely, however, if it can be proved that the plenum system will do, and is doing, what is claimed for it, the small extra cost is not worthy of consideration. Hardly less important than the character of the instruction which our children and adults receive are the physical conditions under which that work should be done. It is quite unreasonable and unfair to expect the best work from our scholars in rooms in which the air is loaded with impurities, and it is even worse in the case of the teachers. The teachers have to spend their lives in the schoolrooms, the children only a few years. The head master of one of the board schools in Leicester, in which the plenum system is installed, puts the matter very well. He says, in April, 1893: "For keeping the air pure and at a uniform temperature the plenum system of warming and ventilation is most effective. During the past 15 months—the period school has been opened—the absences of teachers from illness have been reduced by one-half. All the teachers testify to the absence of headaches which they formerly felt under the old conditions." When using the term "old conditions" the head master refers to former experience in schools that were not properly ventilated.

Concerning other methods of warming and ventilation, one of which it may be necessary to adopt where the

plenum system cannot be installed, it must be clearly understood they should not be condemned; the great point to aim at is to adopt some definite system which, as far as structural and local considerations will allow, will fulfill the essential requirements.

The foregoing paper on "English Practice in the Warming and Ventilation of Technical and Art Schools" was prepared by my late partner, Frank Ashwell of Leicester, but was never presented before any of the learned societies in this country, owing to Mr. Ashwell's sudden death last December (1896). I do not think Mr. Ashwell claimed anything very original in the paper, and to some of you, who have given much study and thought to the subject of warming and ventilation, it may appear a mere "primer" to such a subject, but in England, where the literature and practical experience in good warming and ventilation are limited, I consider Mr. Ashwell has added much to the existing facts already known in a clear and concise manner, as is shown in this paper.

The paper covers much ground which has already been covered by others, but it is essential to state clear and unmistakable facts when it is borne in mind that it is written for an English audience. I do not pretend to criticise the paper at any great length. I shall leave that for the members to do, and will merely touch upon its salient points, and endeavor to explain our reasons and conclusions for adopting such practice in England. It must be remembered that we in this country have kept to the large air duct system, with low pressure for propelling the air into the buildings. We have tried the forced blast system in one or two asylum buildings, which answer very well, but preference leads me to the former practice where practicable. I mention this here because the paper referred to is written entirely on the assumption of the low pressure system.

Air Filter.—An important feature in a well equipped warming and ventilating installation is a filter for the removal of the impurities contained in the atmosphere of our large towns and cities. Several patents have been taken out for such devices, but to my mind there is still an open field for a good filter arrangement. The most recent one that has been tried in England is composed of "washed coke breeze," over which is passed a stream of water, either continuous or intermittent as desired. Although I have not tried one myself I have heard good accounts of this one. The filter referred to in the paper has been practically abandoned, owing to the cost of working and repairs.

Exhaust Steam.—The utilization of exhaust steam where combined plants are used has been very carefully considered during the past few years, and it is possible to show great economy from such a combination. It is seldom carried out in schools, as the conditions under which the schools work are very different to those in other buildings, but I have often used the exhaust steam from the electric light engines and warmed my large buildings, such as asylums, &c, with it, showing much economy in working.

Lighting of Trunks.—I quite agree with the author that the main air ducts should, whenever practicable, be lighted, and, by preference, with electricity.

Air Supply.—The amount of air which the author gives, 1000 cubic feet per child per hour, will, no doubt, not meet with the approval of many members, but it must not be forgotten that in England we are only beginning to "feel our way" in warming and ventilation, and I trust that when the question becomes more popular and better understood in the British Isles we shall also be able to give our pupils 30 cubic feet of air per minute, as in Massachusetts and other parts of the States, or even more. But cost plays an important part in good warming and ventilation, and when you speak to an architect as requiring an inlet flue 24 x 14 inches (for a classroom for 60 children) and a similar one for exhaust purposes, he gets positively alarmed and begins to tell the poor warming and ventilating engineer that that will never do, as he will not be able to get the school built under the "limit"—viz., £10 per head, or $50. Again, we have to contend with the automatic warming and ventilating engineer, who simply sticks an outlet (so called "air pump") of some hideous design on the apex of the roof and thinks the job complete; the principle is "so simple" and "so very cheap" that many architects gladly adopt this plan, so that they may be allowed a greater sum for ornamentation, or some kind of "bauble" to be fixed on the main *façade*, so that future generations who may be educated at this wonderful "haven of education" may bless him—forsooth, most likely the rising generation will censure him for spending the public funds in such a ruthless fashion and omitting the most essential feature of the school building—viz., its lungs.

Circuit Pipe.—The "circuit pipe" is much used in installations. It is simple to erect, works noiselessly and with no trouble whatever. It is necessary, however, to have the pipes of large diameter. The author of the paper deserves, I think, all the credit that can be given to his memory for the persistent advocacy of the plenum system. No man strove harder than he to obtain a good firm footing for the plenum system in England, and to-day we can see success written in large letters over his name in this particular line. He was too modest to take credit for much of his work, and left it to others to do the "shouting," but one of the finest memorials that can ever be raised to his memory is the installation of the plenum system at the Nottingham Borough Asylum, nearly 12 years ago. There have been installations carried out before this one in England, I know, but never has a system been carried out on such lines as this one, and it is the envy of all medical superintendents who inspect it. Working, as I did, with the late Mr. Ashwell for close on 13 years, I can say that whatever he took in hand to do himself he did conscientiously and well.

Tests at Liecester Technical School.

	Velocity, in feet per second.	Velocity, in feet per minute.	Feet of air entering room per hour.	Change per hour.	Change of air as arranged on plans.	Air supply per student per hour.
Lower ground floor.						
Room 16.....	8.5	510	82.620	5.6	6	
Room 15.....	7.5	450	78.300	7.2	[illegible]	
Room 14.....	5.5	330	25.740	4.6	5	
Room 13.....	8.5	510	39.780	5.2	5 or 6	
Room 12.....	8.5	510	39.780	5.2	5 or 6	
Room 11.....	7.5	450	35.100	6 4	6	
Room 10	6.5	390	67.860	6.2	6	
Room 9.....	9	540	32.400	5.6	5 or 6	
Ground floor:						
Room 2.....	6	360	21.600	6.6	[illegible]	
Room 3.....	7.5	450	78.300	[illegible]	[illegible]	
Room 4.....	8	480	37.440	6.8	[illegible]	
Mr. Went's Room.....	...	...	.....	...	4	
Library.....	8.5	510	27.540	4	4	
Room 5.....	6	360	28.080	5	4	
Room 6.....	6	360	62 640	5	5	
Room 7.....	3.2	390	76 050	7.8	7.6	
Room 8.....	20	1200	43.200	8	7.6	
First floor:						
Room T.....	6	360	64.800	7.6	7.6	
	6	360	64.800			
Room S.....	8	480	36.000	3.2	3.6	
Room R.....	..	...	.....	...	...	
Room Q.....	11.5	690	41.400	4.2	4.1	
	11.5	690	41.400			
Room P.....	...	...	.....	...	...	
Room O.....	10	600	36.000	3.1	3.1	
Room N.....	7	420	25.200	2.6	2.6	
Room M.....	8	480	17.280	3	3	
Second floor:						
Room I.....	8	480	23.040	2.4	2.8	
Room H.....	7	420	31.500	3.2	3.3	
Room G	8.5	510	38.250	3	3.3	
Room F.....	9	540	19.440	3	3.3	
Room E.....	9	540	32.400	3.4	2.4	
		540	32.400			
Room C. O...	10.25	600	28.800	3	3.3	
			28.800			
	8.5	510	38.250	4	3.5	
Art library....	9	540	19.440	3	3.2	

Number of students not determined.

I again have pleasure in making my acquaintance through this paper with many dear old American friends, to all of whom I tender every good wish and Godspeed.

Since the forgoing paper was prepared I have made some tests at the Leicester Technical School, a copy of which, showing the results obtained, is given herewith. In Fig. 1 is presented an isometrical drawing of the basement of the school, showing the position of the boiler, batteries, flues, &c.

The Gorton Boilers for Greenhouses.

The Gorton & Lidgerwood Company, 96 Liberty street, New York City, are receiving very encouraging reports from places where their boilers are used for greenhouse heating. It is customary among greenhouse men in cold weather to visit their heating systems during the night to replenish the fuel and see that the fire is in proper condition to keep up the temperature. The side feed feature of the Gorton boiler obviates this necessity, the fuel being added to the fire through the openings at four different points in the boiler, and there is capacity for the storage of sufficient fuel to run through the night, this being pointed out as a very decided advantage. These side feed pockets are so arranged that the fuel is gradually fed to the fires as in a self feed stove. The fuel being added at four different points, moreover, leaves, it is said, a bright burning fire in the center of the fire pot, so that the benefits of a surface burning construction are secured. By this means whether their boilers are used for steam or water the florist and his men find that it is perfectly safe, even in the coldest weather, to arrange the fire at night so that it will need no attention until morning, and that steam will be kept up for heating the house or water will be heated for circulation so that no risk is taken. A plant where notable success has been secured is in the greenhouse of Robert M. Schultz, at Madison, N. J., where one of their large boilers with a capacity for 2200 square feet of surface is reported to be doing excellent work

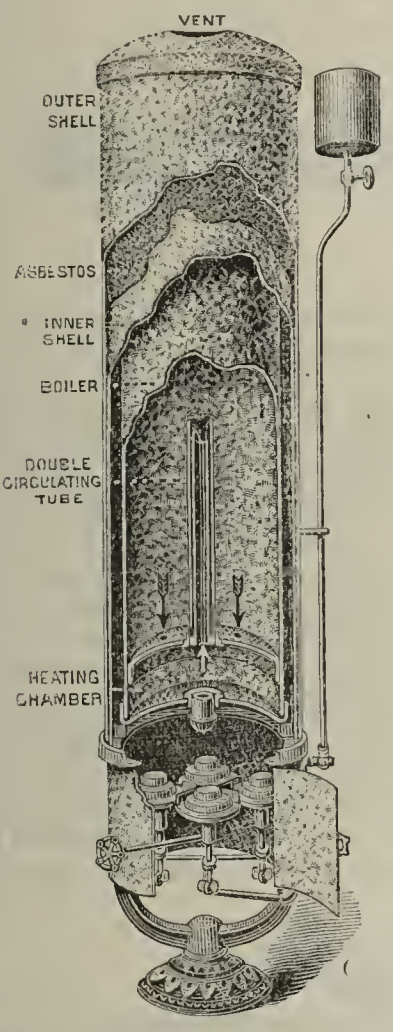
A New Master Plumbers' Association in Baltimore.

As the result of a circular sent to the master plumbers in Baltimore, Md., not members of the Master Plumbers' Association, a well attended meeting was held at Grand Army Hall, on East Baltimore street, on Tuesday, February 8, for the purpose of forming a new association for mutual protection and the obtaining of certain rights and privileges which, it is claimed, are withheld from them.

Addresses were made by Wm. McAllister, who called the meeting to order, Davis L. McCahan, John A. Wilson and F. O. Singer, explaining the objects and necessity of concerted action. Arrangements were made to effect a permanent organization with F. O. Singer as temporary president, Chas. Wagner, secretary, and Wm. McAllister, treasurer.

A Gasoline Water Heater.

The success which has attended the introduction of the Iron Clad gas water heater has brought to the Iron Clad Mfg. Company, 24 Cliff street, New York City, many inquiries for the same apparatus to be heated by gasoline. In the accompanying illustration we present a cut of their water heater and boiler arranged for heating by



A Gasoline Water Heater.

means of a gasoline burner. The burner is of the single generator type and made with four burners, so that the entire number or only one burner may be used as desired. The burner is arranged so that it can be swung out from underneath the boiler for lighting or any other attention that may be necessary. In order to provide against the possibility of accidents in filling the tank with gasoline it is so arranged that the tank cannot be filled until it is dropped down from a perpendicular to a horizontal position. This operation shuts off the burners and puts out the fire, so that should any gasoline be spilled there is no danger of a conflagration. This burner has been fully tested by the company, and it is pointed out that there is no difficulty in heating water quickly at a somewhat less cost than it can be done with gas. Boilers arranged with this burner can be furnished in different sizes to meet the requirements of small or large families, and are adapted for being heated with a water back during the season when a fire in the range is used. A new circular is being issued by the house giving full particulars about this device.

The S. W. Owens Heater Mfg. Company succeed the C. R. Meres Mfg. Company, at Norwalk, Ohio. Mr. Owens has purchased all the patent rights for manufacturing the Duplex heaters, and Mr. Meres will continue with the company as the spuerintendent of the factory.

San Francisco Plumbing Ordinance.

A letter dated February 3 from John L. E. Firman, San Francisco, Cal., states : "It is with great pleasure that I have to inform you that our plumbing ordinance regulating the manner of doing plumbing work in this city has been finally passed by the full Board of Supervisors, and has been signed by his Honor the Mayor, and is now law. I have but just now been given authoritative information, which I make haste to forward to you. You will please accept our sincere thanks for the encouragement and aid rendered. You bid us be of good cheer since our cause was worthy, and we trust that we have not been, and never may be, unworthy of your esteemed sanction."

New Orleans Master Plumbers.

The Master Plumbers' Association of New Orleans, La., includes the following houses among its members : J. H. Aitken & Co., A. Aschaffenberg & Co., M. Briedy, M. Birtel, J. D. Burghardt, W. T. Flood, F. J. Gormley, C. C. Hartwell, L. M Leo & Co , L. Luderbach, M. T. Murphy, J. S. Gaiennie & Co., Manion & Co., New Orleans Railway & Mill Supply Company, Limited, J. A. Reynolds, A. J. Thiberge, P. H. Quinlan and J. E White.

The association has now been in existence three years and is working systematically to secure better plumbing in the city. The officers for the year are :

President, L. Luderbach.
Vice President, Martin Manion.
Secretary, C. A. Hartwell.
Financial Secretary, W. T. Flood.
Treasurer, J. E. White.

The association is now endeavoring to secure the enactment of an ordinance to control and regulate plumbing work.

Minnesota State Plumbers.

The annual convention of the Minnesota State Association of Master Plumbers will be held in St. Paul, Minn., at the Capitol Building on February 16 and 17. The headquarters of the delegates will be at the Metropolitan Hotel. Representatives of the Executive Committee of the National Association of Master Plumbers are expected to be present and representatives of the State Association have been sent to Chicago for the purpose of consulting with the National officers, who will be invited. On the 17th a banquet will be given at the Metropolitan Hotel. The arrangements for the convention and banquet are in charge of a committee composed of John Dwyer, chairman, and Messrs. Hudner, Keys, Bailey, Prendergast, Gerber and Black.

The Use of Water Meters.

In Philadelphia, where there is some trouble experienced in obtaining a proper supply of water, an attempt is being made to prevent the waste of water by the use of meters, to which some objection is being made. In commenting on this the *Ledger* makes the following observations : There should be no more opposition to water meters than there is to gas meters, and there would not be if the people were as well accustomed to the one as to the other. Their use is based on the same principle, and while there may be some difference in their application, since water is a necessity while gas is not, this is not enough to invalidate the principle. The use of water meters should be made compulsory and universal. It is true that water must be supplied to some persons who cannot pay for it, but it should be measured in every case and the question of free delivery settled by itself. Measuring the water and paying for it are distinct questions, and need not be dealt with as inseparable. The use of meters is demanded as the only means to stop waste. At least half the water supplied to this city is wasted, and the waste not only costs as much money as the amount used, but it impairs the quality of the whole by withdrawing the water from the reservoirs before it has time to purify itself by subsidence. The introduction of meters would be the quickest way of affording relief in the water difficulty, and while it would not solve the problem it would help to preserve the health and comfort of the people while waiting for a pure water system to be selected and installed.

CANADIAN MASTER PLUMBERS.

The semiannual meeting of the Executive Committee of the National Association of Master Plumbers of the Dominion of Canada was held in Montreal on February 3 and 4. There were present Joseph Wright of Toronto, president; William Smith, vice-president, of London, Ontario; William Mansell, secretary, of Toronto; William Stephenson of Winnipeg, Man.; J. McKindly, Ottawa; Joseph Lamarche and P. J. Carroll, Montreal. Messrs. Borton, Perrier and Doody, representatives of New Brunswick and Nova Scotia, were prevented from attending on account of the great snow storm blocking all the trains. J. W. Hughes, past national secretary, and J W. Harriss, president of the Montreal local, were appointed to represent them at the meeting.

Much regret was expressed at the absence of O. Picard from Quebec and W. M. Briggs, Jr., treasurer, who were both detained by illness. A number of sessions were held at which important business in connection with the welfare of the trade was transacted. A large meeting was held in the rooms of the Builders' Exchange of Montreal, between the Executive Committee and the wholesale dealers and manufacturers. After a discussion of matters of mutual interest a committee of manufacturers and dealers was appointed for conference with the Executive Committee. The supply house representatives were from James Robertson & Co., Thomas Robertson Company, the Gorton-Masson Company, Warden, King & Son and the Steel Clad Bath Company of Toronto, the representatives of the Master Plumbers' Association being Joseph Wright, W. Smith, James McKindly, William Stephenson, Joseph Lamarche, P. J. Carroll, J. W. Hughes and J. W. Harriss. At the joint meeting of these two committees a number of matters were adjusted to the satisfaction of all concerned.

One feature of interest discussed was the amalgamation or affiliation of the Dominion association with the United States association, and also with the master steam fitters of the United States. President Wright will shortly visit Chicago on this important business.

The master plumbers of Montreal entertained their visitors and the wholesale dealers and friends at a banquet held at the Queen's Hotel in the evening. J. W. Harriss, the president of the Montreal local, presided, at his right being Mr. Wright, and at his left Mr. Stephenson. J. W. Hughes was called upon by the president to propose the toast to the visitors and humorously remarked that though he had a fair knowledge of two languages he found it difficult to command sufficient words in both combined in which to welcome them. Mr. Hughes referred also to the pleasant relations existing between the wholesale and retail trade and the value that such gatherings had in advancing sanitary matters. Among the representatives of the wholesale supply firms who were present and spoke were Lieutenant-Colonel Massey, H. R. Ives, W. H. Wall, H. H. Lamontagne, James Robertson, W. Robertson and J. H. Moore of Boston. The banquet, which was a most successful affair and formed a fitting termination to the proceedings, was under the charge of a committee comprising P. C. Ogilvie, F. Hortan, J. Watson, P. J. Carroll, Thomas Moll, Alfred Paquin and L. Lamarche.

H. R. Lincoln of Worcester, Mass., and W. E. Duquet of Boston, Mass., have formed a partnership to carry on a steam and hot water heating business, with office on Vine street, Worcester, Mass.

The Brackin Pipe Wrench.

The Brackin Mfg. Company of Cleveland, Ohio, are placing on the market the Brackin pipe wrench, the construction and operation of which are shown in the accompanying illustrations, of which Fig. 1 is the tool complete and Fig. 2 the four working parts in proper combination, indicating the distribution of strain. As is known, a pipe wrench is frequently used for bending pipe and for other purposes where its strength is severely tested. One of the objects of this invention is to provide a pipe wrench having a stationary jaw with a yoke firmly secured thereto and provided with a movable drop jaw and so constructed that the fulcrum or bearing of the movable jaw will occur at that point of the wrench where the stock is the strongest. The makers in constructing this tool, we are told, have made durability and strength a prime feature. The jaws and pawl are drop forged from tool steel, special attention being given to tempering. The yoke and lever are drop forged from machinery steel. The surface of the lever which comes in contact with the end of the pawl is case hardened, and the fulcrum rivet in the under side of the arched portion of the yoke is tempered. All parts are interchangeable. The stationary jaw, shown in Fig. 2, fits securely on the lever, and as the strain is upward forms a lock joint. In turning a pipe the movement of the pawl is downward, making practically another similar joint. This formation and arrangement of parts relieves the yoke, shown in Fig. 1, of strain. Adjustment is readily made. By means of the pawl thumb piece, shown in Fig. 1, the teeth are disengaged, and the jaw being released can easily be moved in or out. To operate in close quarters or to adjust for a smaller pipe it is only necessary to push on the lever, resting the jaw on the floor or against the pipe, when it adjusts by the ratchet movement. This method shows how easily the wrench can be used with one hand. The object of the pawl thumb piece is merely to disengage the ratchet teeth. It bears no strain, Fig. 2 showing the strain is on the pawl, and not on the disks in the side openings of the yoke. This is said to be demonstrated by taking the four working parts, without yoke and rivets, and placing them on a pipe in proper position, as in cut. The grip is as secure, we are advised, as if the yoke and rivets were in place, the parts remaining intact and turning the pipe. Having a sensitive fulcrum, locking of the wrench upon a pipe is made impossible. It secures a firm grip, will not plane the pipe and releases its hold readily. A sidewise turn of the lever or a light pressure on the end of the jaw will free the wrench from the pipe. Crushing is prevented by the upper end of the movable jaw stopping when it strikes the top of the yoke. The wrenches are made with a bright finish throughout or with parts japanned.

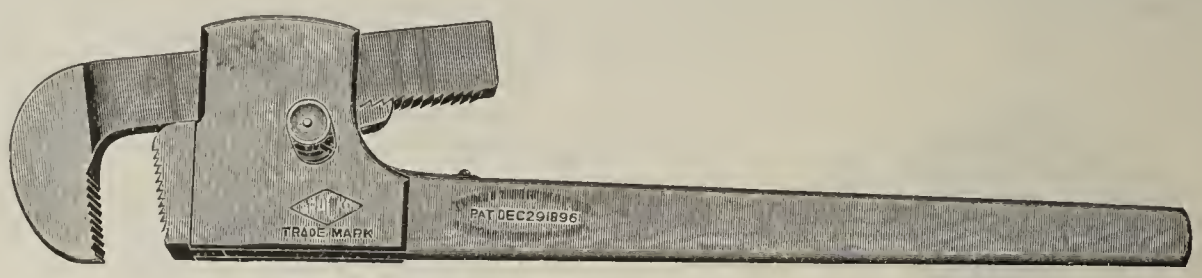


Fig. 1.—Brackin Pipe Wrench.



Fig. 2.—Working Parts.

NOTES.

Bills have been introduced in the Legislature of Massachusetts, one for the appointment of additional boiler inspectors and another for protecting dealers in furnaces against buyers on mortgage.

A protest signed by 38 master plumbers of Rochester, N. Y., has been filed with the authorities at Rochester, N. Y., against the removal of all trench inspectors from the city government. The protest states that the plumbers are well satisfied with the rules established in connection with this department, because it places all plumbers under the same restrictions and all work must be properly performed. They also state that inspection of this class of work is a means of having all underground work performed as it should be.

Increasing business has necessitated that W. A. Case & Son, jobbers of Plumbers' and Engineers' Supplies, at

Buffalo, N. Y., enlarge their plant. They are about to erect on Washington street a building having a frontage of 80 feet and a depth of 115 feet, and five stories in hight. The building will be in direct connection with their store on Main street. The new building is designed for store and office purposes.

The stationery put out by the Judson A. Goodrich Company shows their trade-mark in a bright red in the corner, and the name and address of the company with the words "High Grade Steam Specialties" displayed in clear and distinct type. Those who are in need of Air Valves, Radiator Valves and anything in the Valve line are invited to correspond with the house at 120 Beekman street, New York City.

We have received from the Steel Bath Mfg. Company, corner Wayne and Congress streets, Detroit, Mich., a very handsome circular of their new Duplex Copper Lined Tinned and Planished Bathtub. It is printed on fine paper in three colors, the picture of the tub being in black on a buff ground surrounded with a scroll design. The circular describes the Duplex as a sheet metal bath lined with copper, which is deposited directly on the steel by the electrolytic process. This process is said to be the latest method adopted for coating sheets and tubes with copper. It is further claimed that it is an absolute guarantee as to purity. The electric current acts as a refining agent. The circular points out that by this means a superior bathtub is produced at a very low figure. Correspondence is solicited from those who wish further description and particulars.

Mr. Fuller has sold out his interest in the plumbing business of Rockwell & Fuller, at Sandy Hill, N. Y. The business will be continued by Mr. Rockwell.

Sawyer & Dean, manufacturers of Plumbers' Specialties, Haverhill, Mass., have recently made a large extension to their nickel plating plant.

J. T. Corcoran has taken one of the new stores on High street for his plumbing business at Brockton, Mass.

Patrick Murphy has opened a plumbing and tinsmithing shop on Pitkin street, Burlington, Vt.

W. R. Armstead has purchased the plumbing business of E. Hogan & Co., 417 South Fourth street, Leavenworth Kan.

The Supreme Combination Water Heater Company have been incorporated at Bayonne, N. J., with a capital stock of $50,000 to manufacture Water Heaters. The incorporators are John H. Coe of Paterson and William H. Vreeland and Frank H. Hobbs of Bayonne.

C. A. Jaynes, who is well known in the Steam Supply trade in New York City, is now representing Stanley G. Flagg & Co. of Philadelphia, Pa., with an office in the St. Paul Building in this city.

Erwin W. Newhard has bought the plumbing business of John Hanes, 21 South Sixth street, Allentown, Pa. He has taken John Seagreaves as a partner, and the new firm will be known as Erwin W. Newhard & Co.

The Illinois Malleable Iron Company, manufacturers of Plumbers' Supplies, Chicago, whose works are on Diversey avenue and the Chicago & Northwestern Railway, suffered some damage from fire on the 3d inst. The roof was ignited by sparks from the cupola, but it was fortunately extinguished before it had gained much headway. The loss was about $1000.

The Kellogg-Mackay-Cameron Company, selling the American Boiler Company's Steam and Hot Water Heaters, 84 Lake street, Chicago, have received plans for heating an office building at Melbourne, Australia, on which the architects desire them to bid The request is for steam and hot water so that a choice can be made.

The L. Wolff Mfg. Company, Chicago, Ill., have bought of Sprague, Smith & Co. for $49,000 the ground and buildings at Carroll avenue and Robey street, on the southwest corner of that intersection. The buildings will be added to the plant of the company in the manufacture of Plumbers' Supplies. The purchase comprises a frontage of 123 feet on Robey street and 125 on Carroll avenue. The building is of brick and stone and is five stories in hight.

The Ruud Mfg. Company of Pittsburgh, manufacturers of the Ruud Instantaneous Water Heater, have removed their offices from 32 and 34 Ohio street, Allegheny, to 214 Wood street, Pittsburgh, where the concern have opened offices and will also keep a full line of Water Heaters of the above type.

Henry B. Francis, Plumbing Inpsector of Camden, N. J., in his address before the convention of the associated health authorities of Gloucester County, at Woodbury, N. J., on "House Drainage and Plumbing from an Inspector's Standpoint," said: "Plumbers should sustain the inspector in his work; but, unfortunately, many of the plumbers attempt to elude the inspector by various subterfuges. All plumbers should be made to pass an examination before a Board of Examiners, composed of the members of the Board of Health, thereby protecting themselves from would be plumbers, who are a menace to the health of any community. A great portion of the malignant diseases in the large cities, where the sewerage systems prevail, are due to improper construction of sanitary arrangements, often because of the ignorance of the plumbers, and in many cases because of neglect or a mistake."

Health Commissioner McShane of Baltimore, Md., after conferring with a committee from the Master Plumbers' Association, has placed in the hands of Mayor Malster a revised plumbing ordinance which he asked to have adopted as soon as possible. The Commissioner says: "We have improved and rearranged the regulations in connection with the Master Plumbers' Association in order to provide scientific and modern sanitary plumbing. Our principal care has been to prevent sewer gas and noxious odors from getting into dwellings from old fashioned drain pipes, and this will be done by a system of traps. Plumbing in old buildings is often deficient in this respect, especially in blocks of houses not conforming to the same level."

John M. Tate has leased one of the new brick store buildings at 320 Third avenue, Pittsburgh, and will use it for his plumbing business.

The Patterson Generator Company of Batavia, N. Y., have sold to the Monroe Furnace Company of Monroe, Mich., the right to manufacture their acetylene gas machines in Michigan. It is said that the company will immediately manufacture 2000 machines, and will push the sale of them in their territory.

The meeting of the Connecticut State Association of Master Steam and Hot Water Fitters will be held in March at a date that has not been finally determined. Those who are interested in this field should file notice of their desire to be present with S. E. Dibble, 639 Grand avenue, New Haven, Conn. All who are engaged in the heating contracting business are invited to attend.

J. Denby, Jr., who is in the plumbing and steam fitting line at Sanford, Maine, will be glad to receive catalogues from manufacturers and jobbers of Plumbers', Tinners' and Steam Fitters' Supplies.

The Metal Worker acknowledges the receipt of an invitation to attend the social evening and smoker given by the Master Plumbers' Association of Newark, N. J., at Achelstetter's Hall, 844 Broad street, on February 16. The committee in charge has procured good talent and music to enliven the occasion.

A letter from Oliver Schlemmer, Cincinnati, Ohio, informs us that the O S Distributing Fittings are included in the specifications of the United States Government for heating barracks. This is looked upon as a specially good recommendation by Mr. Schlemmer. He also reports that when the roughing in season opens up with the plumbers a good business is expected for another of his specialties, the Temple Vent Fitting for house drainage systems.

Stewart & Keerl are a new plumbing firm at 1718 Main street, Marinette, Wis., having purchased the plumbing branch of the business carried on by Watson Bros. & Hitchcock.

The Thomas A. Lane Company of Manchester, N. H., are very much pleased with the result of the test of the heating and ventilating system which they placed in the High School Building in that city. On Monday, February 1, the mercury dropped to 22 degrees below zero during the night, yet when the school assembled at about 8 o'clock in the morning the temperature throughout the building stood at 70 degrees.

The A. R. Bailey Mfg. Company have been incorporated at New York City to deal in Water Stills and Sanitary Specialties. The company have a capital stock of $300,000 The directors are Samuel B. Benn, C. B. Pierce, B. H. Newell and George E. Poulson of 32 Nassau street, New York.

Huey Brothers of Boston Mass., have opened an office in charge of W. J. Sutherland, 127 Worth street, New York, where they are engaged in a heating contracting business, and make a specialty of school house work. They have recently secured the contract for heating two new school houses at New Rochelle, N. Y.

Hull, Camp & Co., 127 Worth street, New York City, report a good business in the Range, Boilers and Expansion Tanks made by W. B. Scaife & Co., Pittsburgh, Pa. They are also carrying a stock of the varied line of Steam Specialties made by the Clarence E. Van Auken Company of Chicago. They are giving special attention to filling orders for Air Valves promptly.

F. A. Wendell, Beverly, Mass., has been awarded the contract for plumbing five stores in the Quimby Building at Boston.

TIN PLATES.

Tin Plate on the Pacific Coast.

The Custom House records show that the amount of foreign tin plate entered for consumption at Pacific Coast ports in 1897 dropped to something over 250,000 boxes. The actual imports last year were 29,945,204 pounds, valued at $715,904, as compared with 37,226,304 pounds in 1896, a falling off of 7,281,100 pounds, or about 67,417 boxes. As the consumption of tin plate on the Pacific Coast in 1896 was considerably below the average, the sharp falling off in 1897—a year of fairly large consumption—from the figures of the previous year, illustrates the fact of the gradual appropriation of the Pacific Coast market by the domestic manufacturers of tin plate, which became so pronounced last year.

Nevertheless, the impression prevails that it will be some time yet before the English product is entirely superseded by the American in that region. Bearing on this subject, the following remarks of a correspondent at San Francisco, Cal., are of interest:

In the article of tin plate, Albion seems to hold the fort despite the brisk competition from the American side, as witness the large importations of the past year. The duty here is a most effectual protection to the American article, as it permits increasingly large quantities to come across the Rocky Mountains, and has been the main cause of the low prices that have prevailed for such a long time. No doubt great inroads will be made on the foreign article. But the tin plate destined for the British Columbia canneries will continue to come to San Francisco from England, and as the salmon pack of the colony is increasing at a great rate our imports from England will always be of considerable volume.

The Tin Plate Consolidation.

The committee which is endeavoring to consolidate the tin plate interests in this country held a meeting in New York last week. The committee of four appointed by President D. D. Reid of the Tin Plate Manufacturers' Association met with representatives of four of the largest New York tin plate merchants. This committee consisted of President D. D. Reid, *ex-offieio*, who also represents the American Tin Plate Company of Elwood, Ind.; R. S. Quay of the Monongahela Tin Plate Company of Pittsburgh, C. A. Robinson of the La Belle Iron Works of Wheeling, W. Va., and Warner Arms of the Falcon Sheet & Tin Plate Company of Niles, Ohio.

It is understood that the meeting was of the utmost importance, especially as far as the merchants are concerned. The working plans of the committee and a proposition were laid before them. This latter, it is reported, was to the effect that if the four concerns represented wished to co-operate with the proposed consolidated company they would be expected to contribute one-third of the expense of the undertaking. A protest was entered on the part of the merchants, but the committee left them to understand that were this proposition not taken advantage of the combination could be formed among the mill owners, regardless of the New York merchants.

As the situation now is, the consolidation may either be formed between the mill owners and these four New York merchants or simply among the mill owners, irrespective of the dealers.

One of the four merchants when seen by a representative of *The Iron Age* stated that a movement similar to the one on foot would doubtless be brought to a successful issue in the near future, but that the plans on which the present committee was working would require considerable modification before they could be operated successfully.

Many in the trade look on the consolidation as far distant and claim as a justification for their belief the fact that some of the mills which are most conspicuous in the movement and which would be most affected by its formation have taken a sufficient amount of orders to employ their mills until July next and are now booking orders to be delivered during the last few months of this year. One of the large mills offered last week to sell upward of 50,000 boxes of tin plate to be delivered at any time between the placing of the order and next December.

The combination if effected will doubtless have a tendency to raise prices, and if an early consolidation were under way these mills would know of it and would not be quite as anxious to book future work as they apparently are.—*The Iron Age.*

SCRAP.

There was a much more cheerful feeling in the metal trade this week. All the metals have improved in tone and prices have developed an upward tendency. Only Tin Plates are left in the rut, out of which no lever seems strong enough to lift them. Uncertainty about the projected consolidation of interets in this line is held responsible for the continued depression in Tin Plate prices and the absence of large buying.

Special Treasury Agent Bunn of Boston, Mass., has recently returned from a trip to the Maine coast, where he went to look up alleged cases of the smuggling of Tin Plate for use in fish canning at Eastport and other places. An English schooner laden with Tin Plate, was seized a few weeks ago, but Mr. Bunn believes it will be the last one under the present conditions, for the inducements to smuggle English Tin Plate into this country have been reduced to a minimum by the production here of Tin Plate of superior quality, which can be sold with profit to the manufacturer at a comparatively small advance over the first cost of the English article. The Maine consumer can now purchase American Tin Plate from New York and Eastern dealers at about $3 per box of 80 pounds, whereas the English article costs about $2.50, without the duty. Thus it is cheaper to buy the American product, which is equally satisfactory with if not better than the foreign. The Tin Plate smuggling industry therefore seems to be a thing of the past in this country.

A firm in Glasgow, Scotland, are about to start a factory for the manufacture of Tin tea chests, or rather tea chests of Terne Plate, with a capacity of about 1,200,000 cases a year. The top and bottom of the chests are of wood, lined with thin metal, and the body is made exclusively of steel coated with a mixture of lead and tin. Ingenious machinery has been devised for turning these chests out in large numbers with the maximum economy of time and labor.

At a recent meeting of the stockholders of the Laughlin Nail Company, Wheeling, W. Va., a resolution was passed to extend the life of the corporation 50 years to 1948.

Joseph Skewis, Sr., lately superintendent of the Buhl Steel Works, Sharon, Pa., has been appointed superintendent of the New Castle Steel & Tin Plate Company's plant, New Castle, Pa.

Local difficulties have caused some trouble among the Sheet and Tin mill operatives at Canal Dover, Ohio, involving a temporary shut down of the mills. Efforts are being made to straighten out the difficulty, which it is expected will soon be adjusted.

We are advised by C. M. Stewart, secretary of the Morewood Company, Gas City, Ind., that a statement recently published to the effect that a bar mill is being added to the company's Tin Plate plant is incorrect. They have had a bar mill in operation for years. Within the last two or three months some rather extensive alterations and improvements have been carried out at the Morewood Works, which probably gave rise to the report.

The trade and navigation returns of Canada, just published, for the fiscal year ended June 30, 1897, show the total value of imports of Tin Plates into the Dominion for the year to have been $918,006, of which $767,280 was received from the United Kingdom and $150,726 from the United States, the last showing an increase over the previous fiscal year of $26,000.

Mrs. Isabella Fitz Randolph Bruce, widow of John M. Bruce, Jr., head of the tin plate and metal house of Bruce & Cook, died at her home in New York City on Wednesday after a long illness, having survived her husband 13 years. Mrs. Bruce had been blind for two years before her death. She leaves a son, the Rev. James M. Bruce of Yonkers, and a married daughter.

THE RETAIL STORE.

Robertson Hardware Company's Store.

The accompanying cuts relate to the Hardware establishment of the Robertson Hardware Company of Fort Dodge, Iowa., and show some of the fixtures, which were furnished by the J. D. Warren Mfg. Company, Chicago, Ill., who are well known as manufacturers of Hardware store fixtures. The main building is 24 x 80 feet, with an L, which gives them 24 x 17½ feet additional space, frontage being thus had on two streets. The company occupy three floors and basement. The first floor is used as their retail salesroom, and the fixtures shown herewith are employed on that floor. Fig. 1 shows a portion of the shelving on the right of the entrance, which extends back to the office, the latter being at the extreme rear of the main portion of the room. In the rear of the wall cases shown in the cut are shelves with drawers, the shelving above the wall cases being the same all the way back. The shelving shown in Fig. 2 is on the opposite side of the room, and extends back to a stairway near the intersection of the L. To the left of this shelving is a wall case, a small portion of which is shown. This wall case extends to the hight of the shelving and contains Nickel Plated and Brass Ware, Family Scales, Lanterns, &c. Traveling ladders on both sides of the room give access to the goods on the upper shelves. Counters are conspicuous by their absence, as two short ones for wrapping are the only ones used. The present method of arrangement is found by the company much better and more convenient than their former plan of having counters on both sides of the store, full length of the shelving.

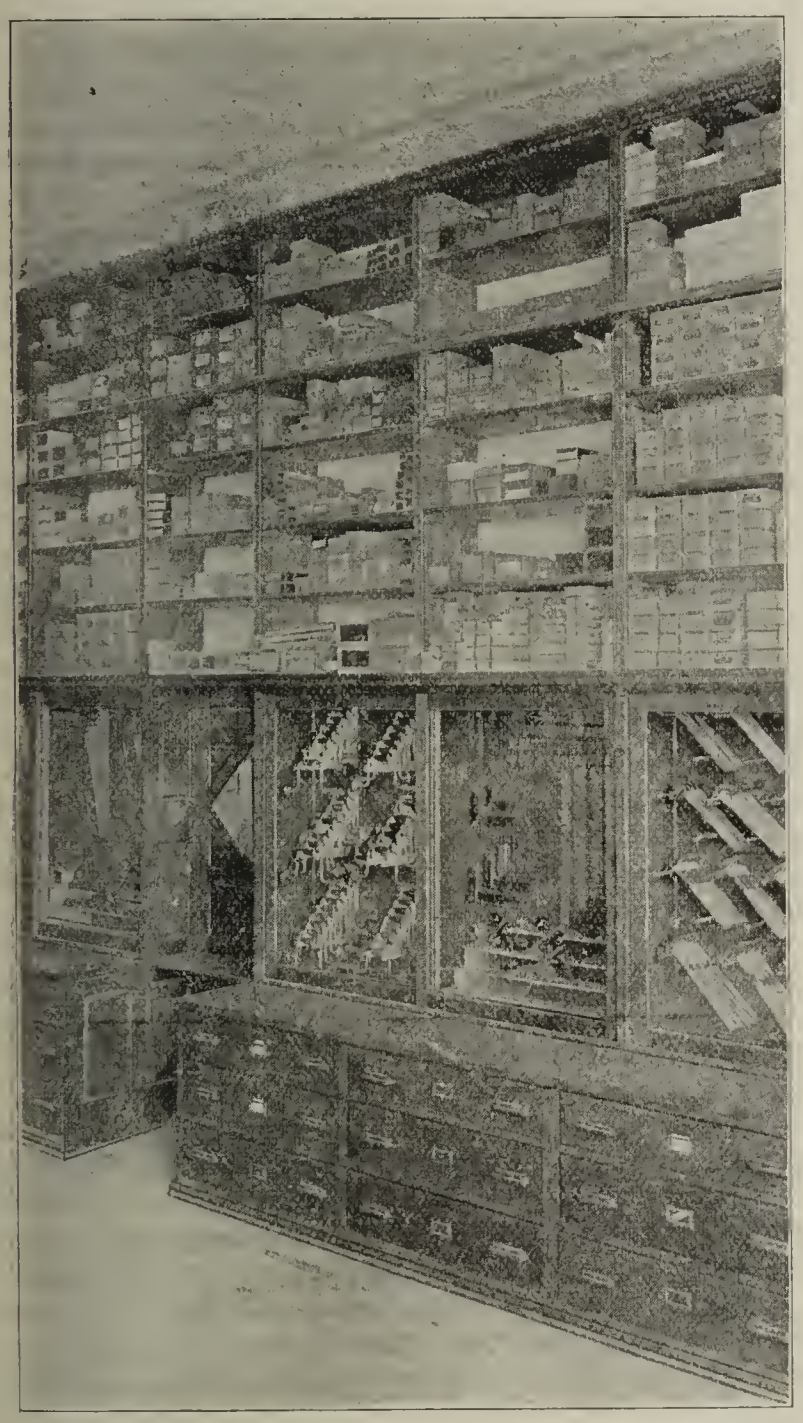


Fig. 1.—Wall Cases and Shelving.



Fig. 2.—Enameled and Tin Ware.

The absence of counters is regarded as giving the store a better appearance, besides supplying a great deal more available space. The company express themselves well pleased with the arrangement and display of the fixtures, and with the improvements are enabled to get along with one clerk less than formerly. The second floor of the establishment is used for the storage of goods in original packages and for wholesale stock generally. This room is fitted up with gallery shelving on three sides, which nearly doubles its capacity. The shelving is used for such light goods as Tin and Enameled Ware, &c. Racks at one end of the room contain Shovels, Spades and Farming Tools. The third floor is occupied by the tin shop, and the stock of Tinners' Trimmings, Tin, Sheet Iron, &c. In the basement are carried Nails, Wooden Ware, Horseshoes, staples and other heavy goods. An elevator runs from the L room in the basement to the third floor. The stock of Stoves is kept in a warehouse located on the railroad.

A catalogue of Lamps and Lanterns, manufactured by George W. Deitz & Co., 243-245 Pearl street, New York City, which is being distributed to the trade, is a pamphlet of 46 pages, and presents illustrations of a great variety of goods made by this concern. At the back of the publication is a price-list of the goods referred to.

THE WISCONSIN RETAIL HARDWARE ASSOCIATION.

The retail Hardware merchants of Wisconsin held their second annual meeting at Milwaukee on the 2d and 3d inst. The names of the new members received since the July meeting are as follows:

C. C. Williams, Waupaca.
Mrs. S. M. Schultz, Medford.
R. W. French & Son, Ashland.
Thos. S. Cunningham, Berlin.
Jenkinson & Fry, Ripon.
Murphy & Kersten, Racine.
A. D. Race, Depere.
Hessell & Lykum, Antigo.
John Sturner, Lowell.
Alfred G. Krovucke, Madison.
Marrott Bros., Baraboo.
A. Schutinsky, Milwaukee.
John Hanegen, Fond du Lac.
Sumner & Morris, Madison.
Krehl & Pick, Madison.
F. M. & M. M. Finch, Whitewater.
D. G. James, Richland Center.
Rather & Schaubel, Wrightstown.
C. S. Scherrin, Marshfield.
F. A. McKellips, Arlington.
C. F. Hanson, Markesan.
Ole Wigdale, Fort Atkinson.
Hager Bros., Fort Atkinson.
Anderson & Fritz, Racine.
O. J. Williams, Cambria.
J. D. Frentlage, Milwaukee.
H. W. Krognan, Milwaukee.
F. Hornbrocek, Milwaukee.
J. S. Druse, Milwaukee.
Chas. Schosson, Milwaukee.
H. Salentine & Sons, Milwaukee.
Menzel & Kemps, Oshkosh.
G. H. Bruns, Lake Mills.
Dixon, Malone & Co., Racine.
C. Jorgensen, Racine.
Hoernel Hardware Company, Racine.
Jacob Nohr, Racine.
Frank Bauman, Racine.
Gaffron & Trowbridge, Plymouth.
W. Bindler, Stockbridge.
L. W. Dukerchein, Mazo Manie.
D. & F. Kusel, Watertown.
Sackes & Schroder, Lake Mills.
W. J. Neiderfous, Genoa Junction.
O. F. Luder, Plymouth.
J. A. Dunston, Hollandale.
J. Droekamp & Sons, Milwaukee.
H. B. Simcox & Bros., Marinette.
The E. Wagner Company, Manitowoc.
Smith Bros., Wauwatosa.
H. P. Chase & Co., Marinette.
G. W. Adams, Juneau.
Wm. Webber, Watertown.
R. C. Murdock, Brodhead.
Lee, Pratt & English, Baraboo.
T. H. Goodhue, Whitewater.
Smith & Meadows, Oconomowoc.
Chas. Janish, Waterloo.
Miller & Statz, Sun Prairie.
F. W. Marcussen, Platteville.

President John Hughes of Fond du Lac rapped the members to order for the opening session at 3 o'clock. Secretary C. A. Peck of Berlin called the roll of membership for responses, which showed that a very large majority was present.

The first business laid before the association was a communication from the Minnesota Hardware Association suggesting the appointment of delegates to meet similar delegates from Minnesota and North Dakota to organize a Northwestern Hardware Association.

The routine business was taken up, President Hughes opening with some congratulatory remarks on the progress of the association in the past year and the bright prospects for the future. Secretary Peck presented an interesting report of the work done by him, giving statistics of the growth of the association and its business and presenting some facts which showed the practical value of the organization. Very few complaints were received by the secretary against manufacturers and jobbing houses, but all were harmoniously settled.

A committee to nominate officers for the ensuing year was named by the convention as follows: Arthur Heins of Elkhart Lake, D. G. James of Richland Center and Geo. P. Dana of Fond du Lac.

While they were preparing their report Vice-President Andrew Noll of Chilton read the following paper on

The Objects of the Wisconsin Retail Hardware Association.

For the privilege and honor of appearing before you, and for the opportunity of addressing you here to-day, I extend to you my thanks. Probably the most important and certainly the most interesting question with reference to our organization, so frequently asked, not only by the organizers and promoters of this association, but by nearly every Hardwareman of this State, is: "What is the scope and purpose of this association?"

I have oftimes had a desire to be able to answer this question satisfactorily, and as fully and worthily as it deserves to be, yet not until our worthy secretary, Mr. Peck, requested me to prepare a paper upon some subject to be read at this gathering had it entered my mind to discuss with you the aims and purposes of this organization. At first I hesitated, but after some consideration my enthusiasm took complete control of me, for I feel that it is the duty of every member of this association to co-operate and assist each other and to exert their best efforts for the good of our organization.

Article 1, Section 2, of our constitution reads as follows: "The object of this association shall be to promote the interest of and secure the friendly co-operation of Hardware dealers." In other words, our preamble means, as the North Dakota Association expresses it: "To promote the welfare of the retail Hardware trade." Now is this not a large undertaking for about 100 Hardwaremen to promote the welfare of the entire community of over 750 Hardware dealers in this State, and how much easier it would be to accomplish the purposes for which we are banded together if we could by some means secure the good-will and co-operation of each and every dealer within the bounds of this State. With an organization consisting of a vast majority of all the Hardware dealers in this State we would be an organization of importance and strength, and this association, as well as the associations of our sister States, could then pass resolutions in no unmeaning terms and devise ways and means to bring our purposes properly before our jobbers and manufacturers, who thus far have successfully ignored the demands of the Hardware retailer and have preferred the trade of the department store over ours, and I trust that the time will soon come when these jobbers and manufacturers will be obliged to come to us and say: "We make and we sell Hardware, and we want to sell Hardware stores only. Your associations are getting too prominent to be overlooked and disregarded any longer. Come, retailer, join hands with us, and in the future let us all work in harmony to accomplish your great object—namely, to lead the sale of Hardware into its regular channels."

As I have said the first and probably main object of our association is to lead the sale of Hardware into its regular channels, to place it where it properly belongs, and the next important object should be to meet and get acquainted; or, in other words, to create and foster harmony and good-fellowship among the Hardware dealers of this State. The first great obstacle in our way is the existence of the so-called general store in our smaller cities and the department stores in the larger cities; and last, but not least, the manufacturers and jobbers who sell their product and wares to such stores. This, our third meeting, as well as all our other meetings, is not called for pleasure, but for business, and we want all of the Hardwaremen of the State to come here and say: "We are capable of selling the Hardware in our vicinity. We pay our bills as promptly as anybody, and we are willing to mend your old tea kettles, but we want to sell your Hardware as well. We do not need a general or department store in our vicinity, and if we are making too much money let the next man come and start a Hardware store aside of ours, but no general or department store. We do not want manufacturers or jobbers to sell direct to the consumers, and we will not buy a dollar's worth of

Hardware from any jobber or manufacturer who sells his wares to these general or department stores. We denounce the catalogue house with its ruthless advertising as unlegitimate and unfair. We mean what we say, and we want everybody to know it, for we are here for action."

Some of you have no doubt had brought to your attention a circular headed "Reform," sent out by a prominent stove house since our last meeting in July, 1897, and which read as follows: "It is to be hoped that some effective way will be found to remedy the evil which department stores are working. In some States the retail merchants have banded together and agreed with each other that they will not buy of any wholesale concern selling these houses. Not only do these department houses greatly injure the merchants who confine themselves to one legitimate line of goods, often driving them out of business entirely, but they reduce the value of property, the owners of stores being unable to rent them at anything like a fair price. If merchants will confine their purchases to and urge the sales of only such goods as the manufacturers refuse to sell to easy payment department stores and catalogue houses, it will go a long way toward remedying the evils which such department stores now work, and all should do this much in the way of helping. For years this house has refused to sell its goods to this class of houses, and is the only stove manufacturing concern which has hitherto maintained this policy, therefore they deserve the encouragement and cooperation of the exclusive Hardware and stove merchants."

Now our next important object is to create and foster harmony and good fellowship among the dealers of the State. Henry C. Webber of Detroit said to the Hardware Association of Michigan on February 12, 1896: "My first advice is to meet and get acquainted. You will quickly learn that the one or the other is not as bad as you thought he was, and good fellowship will quickly root, and sociability of a business character, and later friendship. Cast off all suspicion, for suspicion is the lie to imagination, not always, but in many instances. If you have cause for grievance get together and settle your differences; it must terminate to mutual benefit, and where is the best place? At your meetings."

This brings me again to one of the points which I have before mentioned. We must devise some plan as the result of which we can get at least three-fourths of the Hardwaremen of the State to come here in order to accomplish anything. If the majority of them do not need or rather do not want such an organization as we now have, let us determine this without delay and adjourn forever to-day, but if they do want an organization of this nature, and the experience and the history of the past justifies me in saying the interest demands an organization of this nature, then they must come here to our meetings. I now believe that the only way to get them together or to join will be to imitate our neighbor association of Minnesota, to engage an officer of this association to go and see every one who is outside of the association to-day and induce him to join us. Pay the officer a fair salary, and thus enable him to do the work properly. The members who come here regularly understand our object fully and appreciate the importance of the work before us, and I have no doubt live up to the rules and regulations of our association, but I say to you in all sincerity that our usefulness and importance depend upon the enrollment on our list of members of at least three-fourths of the dealers in this State. I express the fond hope that we may accomplish our purpose, and that every member of our association will exert the best effort within him to co-operate and assist us in the laudable enterprise.

Election of Officers.

The Committee on Nominations recommended for reelection the entire list of officers, as follows:

President, John Hughes, Fond du Lac.
Vice-President, Andrew Noll, Chilton.
Secretary, C. A. Peck, Berlin.
Treasurer, W. H. Hay, Oshkosh.

Members of Executive Committee, in addition to the foregoing: C. E. Dewey of Kenosha, A. H. Sheldon of Janesville and D. W. Ramsay of Madison.

The committee's report was accepted and the officers were unanimously re-elected.

E. K. Rand of Manitowoc read a paper on Unity Among Dealers, which was followed by a paper by George P. Dana of Fond du Lac on The Retail Hardware Business.

Secretary C. A. Peck of Berlin read a paper on Credits, and, after accepting an invitation from the stove manufacturers and other business men of Milwaukee to attend the Alhambra Theatre, the convention adjourned.

Thursday morning President Hughes called for an expression of opinion relative to instructing the association's delegate to the Northwestern Hardware Conference. He hoped that a strong association could be organized, composed of the retail Hardware merchants of Wisconsin, Minnesota and North Dakota, employing a paid secretary and going in vigorously to correct notorious trade abuses. Secretary Peck said that so far but little complaint had been made in Wisconsin against the operations of catalogue houses, who were particularly active in Minnesota and the Dakotas. The annual dues had been kept low because it had not been thought necessary to employ a secretary's whole time, and perhaps the members of the Wisconsin association would not be willing to raise the dues for that purpose. The discussion closed with no instructions given, leaving the delegate to act upon his own best judgment.

Traveling Salesman Pier, representing the Favorite Stove & Range Company, was called on for remarks, and made an excellent address laudatory of associated movements among merchants.

Department Stores.

A discussion of department store competition was opened by Secretary Peck, who asked the question, What are we doing? While opposed to boycotts, he said that all things being equal, he is in favor of patronizing manufacturers and jobbers who do not sell to department stores. He asked for complaints from members when they found manufacturers and jobbers selling to such stores, and an earnest effort would be made to have such trade stopped.

Mr. Watson of Marinette said that in his opinion department stores had done some good, although they had cost him considerable money, because they had brought the Hardware merchants together. He believed that in the smaller towns in which department stores were operated much benefit could be accomplished by all the Hardware merchants watching the bargains advertised by such stores, and whenever an article in the Hardware line was used as "bait" to immediately put out placards advertising a sale of the same goods at a lower rate. The department store bargain is thus deprived of its drawing power, while customers are attracted into the Hardware stores, where perhaps they can be induced to buy better goods. In his locality the department stores are becoming popularly known as "bait stores," because people are finding out that the advertised bargains are simply being used for bait.

Mr. Miller of Genoa Junction explained his method of fighting department stores and catalogue houses. Being but 65 miles from Chicago, he is obliged to meet this competition continually. He keeps the catalogues of these houses on hand, and whenever he can do so he shows his customers that he can furnish the same goods enumerated in the catalogues at the same price or cheaper. He had always found that he could meet catalogue prices if his customers would buy the grade of goods advertised, and gave instances showing that these prices are often higher than those of the retail merchant. He also made a strong argument in favor of changing the system of selling mowers, binders and other agricultural implements for manufacturers on commission, claiming that they should be bought by a merchant in a regular way and sold at his own price.

On motion of R. C. Murdock of Brodhead the secre-

tary was directed to appoint a member in each county to act gratuitously in soliciting new members.

On motion of C. A. Haertel of Waukesha it was decided to hold a meeting in July at Oshkosh, the date to be fixed by the Executive Committee.

An amendment to the by-laws was introduced by E. K. Rand of Manitowoc, providing for the election of an additional member to the Executive Committee, to be a resident of Milwaukee, the amendment being laid over for final action at the next meeting.

A resolution was adopted thanking the managers of the Republican House for courtesies extended, and the trade and daily papers for their assistance in making the meeting a success.

The convention then adjourned.

The Utility Steel Basket.

In the accompanying illustration we show the Utility steel basket which is being put on the market by the Kieckhefer Brothers Company, Milwaukee, Wis. The basket is made in two sizes, to hold one bushel and one bushel and a half. It is made of refined smooth steel, and is furnished either japanned or galvanized. It is pointed out that it is strong and water tight and is said to be everlasting. It is adapted for measuring or handling grain, vegetables or coal, for feeding stock or for carrying water.



The Utility Steel Basket.

Catalogues Wanted.

The branch house at Savannah, Ga., of Charles A. Conklin & Co., Atlanta, manufacturers and dealers in metals, stoves and house furnishing goods, was destroyed by fire February 6. Messrs. Conklin & Co. write us that they would appreciate receiving catalogues and price-lists from manufacturers of hardware, tinware and house furnishing goods, forwarded by mail.

MEMORANDA.

The Rochester Stamping Works, Rochester, N. Y. were specially represented by D. A. Lewis at the second annual meeting of the Wisconsin Retail Hardware Association, held at Milwaukee on February 2 and 3. The concern prepared an attractive exhibit in a parlor of the Republican House, where samples were shown of Rochester Silver Nickeled Ware, comprising Tea Pots, Coffee Pots, Tea Kettles, Baking Dishes, Chafing Dishes, Water Pails, Pitchers, Wash Boilers, &c. This ware is made of heavy sheet metal, copper or steel, brilliantly nickeled.

The Canadian trade returns for the fiscal year ended June 30, 1897, just published, show imports of Stamped, Japanned, Galvanized and Enameled Ware into the Dominion from the United States during the year to have been of the value of $65,058. Tinware of the value of $66,951 was also imported from this country in the same period.

The W. H. Sweeney Mfg. Company, Brooklyn, N. Y., made an interesting exhibit of their goods at the Republican Hotel, Milwaukee, Wis., for the benefit of the members of the Wisconsin Retail Hardware Association, who met in that city for their second annual convention on February 2 and 3. The display, which was arranged by J. C. O'Neil, covered Tea Pots, Cups and other articles in sheet metal, including a great variety of Carpathian Trays. These are untarnishable Trays in pleasing patterns, making an excellent substitute for silver at a remarkably low price. They have always been imported until the past year, but are now being successfully manufactured in this country.

At the second annual meeting of the Wisconsin Retail Hardware Association, held at Milwaukee on February 2 and 3, Gross & Jacobs, hardware merchants, Stevens Point, Wis., exhibited a Sheet Iron Drum or Radiator of new design, for heating an upper room by utilizing the waste heat from a smoke pipe. Two drums are used, one being placed above the other, with tubes connecting them. Heat is not only radiated from the drums and tubes, but openings through the drums enable additional air to be heated and circulated.

J. W. Hellman has purchased the stock of W. C. Furrey, late president of the W. C. Furrey Hardware Company, Los Angeles, Cal., and is now sole proprietor of the business, continuing it under his own name. He intimates that the business will be reincorporated shortly with increased capital. The line of goods handled comprises Shelf and Heavy Hardware, Stoves, Tinware and Plumbing Materials.

Bering-Cortes Hardware Company, Houston, Texas, are now comfortably settled in their new establishment, which was completed several months since. The building is 72 feet wide and 125 feet long and three stories in hight. On the first floor is carried the retail stock of Shelf Hardware and Tinware. The office, 20 x 30 feet, is in the rear of this floor. The building stands on a corner, and on the side next to the street they have a receiving room, 20 x 30 feet. On the second and third floors, which are reached by an electric freight elevator, as well as stairs, is carried their wholesale stock of Hardware and Tinware. They also have a basement, 25 x 50 feet, in which they carry their surplus stock of such goods as Strap Hinges, &c. Heavier goods received in carload lots —Stoves, Barb Wire, Nails, Agricultural Implements— are stored in their warehouse, which has railroad facilities, and from which they do their shipping in this line. The company's business is principally wholesale, though a considerable retail business is done. They have three traveling salesmen, who cover Southern Texas and Louisiana.

Bailie & Stephens have opened up a new Hardware store at Bedford, Iowa, carrying Hardware, Stoves, Buggies, Implements, &c. The members of the new firm were formerly clerks in the Hardware line, one having had ten years' experience and the other seven years. Their store is in a new brick building. The room is 44 x 70 feet, with a handsome plate glass front. It is lighted with electricity.

Walton, Starks & Co., Saranac Lake, N. Y., have purchased the retail stock of Chas. Wood, Lake Placid, and will hereafter run a branch store at that point. At Saranac Lake both a wholesale and retail business is done. The firm's stock includes Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Lumber, Sash Doors, Brick, Lime, Cement, &c. They also have a Tin, Plumbing and Heating shop. They advise us that they would be pleased to hear from manufacturers and jobbers with copies of catalogues and other printed matter issued to the trade.

Geo. H. Stibbs, engineer and contractor for Hot Water, Hot Air and Steam Heating Apparatus, 50 Church street, Hartford, Conn., desires us to invite the trade to send him catalogues relating to Bicycles and Supplies.

A press dispatch from Colorado Springs, Col., reports the gold production of the Cripple Creek district during the month of January, in round figures, at $1,200,000. The production of gold in the Cripple Creek district is steadily increasing and the mining companies operating there are one by one being added to the list of dividend payers. It is expected that the 1898 gold output will far exceed any previous record.

A contract has been placed by the Standard Oil Company for building at the John Roach Shipyard at Chester, Pa., the largest tank steamer ever constructed. She will be 364 feet in length, 48 feet beam and 23 feet draft. The vessel is designed to carry oil in bulk.

The British Minister to Bulgaria has reported to his Government the passage by the Bulgarian Sobranje of a new law for the compulsory establishment of trade guilds. Under this law all persons, whether natives or foreigners, must become members of a guild if they wish to work in Bulgaria at any of the trades.

The Harlan & Hollingsworth Company, Wilmington, Del., have secured a contract to build a large steamship 275 feet long, 41 feet beam and 22 feet depth of hold, for the Virginia & Carolina Chemical Company. The vessel will be supplied with inverted direct connecting surface condensing triple expansion engines with a 42-inch stroke. The boilers will be steel with a working pressure of 160 pounds. The boat is to be completed within six months.

STOVE TRADE NOTES.

CHANGES IN STOVES.

BY REMINISCENT.

From what the closing years of the present century indicate it seems almost certain that the next will open with stoves in vogue such as were discarded many years ago. This may not be news, but it will afford an excuse for an interesting search into the past. Along about 1875 the ambitious farmer was replacing his old air tight surface burner or gas burner, or down draft or oval cast top and bottom wood stove with what he was led to call a morning glory. This applied to all kinds of stoves that shed glory by having illuminating mica windows all the way around, but applied more particularly to self feeders. It was deemed a great thing to be able to put in coal enough at one time to last all day and all night. The evolution of this stove from a black monster to its highest perfection started an era of pattern making, and the designers ran riot in endeavoring to annually produce something to dazzle the eye instead of bringing out a stove that would run a decade and make money for the foundry. The best features for economy and efficiency, as well as the best interest of the final owner, were lost to view in the struggle to throw the other fellow in the shade, unmindful of the fact that square heating stoves had rendered good service before this shape was presented as entirely new.

In its second advent, however, the square stove is entitled to the credit of having created the greatest stir that has ever been made in the stove trade. It brought a study of the artistic in stove construction, which has left a lasting impression for good. Nevertheless the endeavors to embellish so covered the stoves with nickel, tile, decorations, ornaments and bronzes that its efficiency for heating as compared with the old surface burner deteriorated. The square sheet iron, down draft surface burner had a fast and furious run, and though possessed of merit was supplanted by the glittering soda fountain rivals until hard times crippled the consumer. Then the oak stove came to his relief in price, and not being encased in embellishments its radiant heat was freely shed in his dwelling.

This was followed by the tamale stove, which the old timers recognize as a relative of the oval sheet iron wood stove that was in the mother's room or guest chamber of many houses The tamale of to-day is handsomer than its ancestor, and is being made with many now necessary conveniences and even for burning coal. It has a high efficiency, being made of sheet metal, and with the provisions made in the better grades should prove reasonably durable. The oak stove with its sheet metal body and cast iron fire pot is exactly the same so far as heating is concerned, as types that can be found in the catalogues of the third quarter of this century. With their air tight ash pits and draft slides they provide for the same control over the fire that the sheet iron blower had when fitting tightly on an oval rim which was the mouth of the ash pit in the old air tight stoves.

The oak stove of to-day possesses many of the advantages of the air tight surface burner, and only needs to be made in a full revertible flue form to be a still better stove. It is quite gaudy compared with its ancient prototype, which had only the contrast of the well blackened castings and the glossy Russian iron body to enliven it, but which to my mind lent a dignity to an article that was purchased for the economy and comfort it provided rather than for its imposing elegance. Some may not sympathize with my treatment of their productions, but may nevertheless see in this brief review the trend of the trade at the end of the century to the paths that were opened at a time when economy and efficiency were held in higher esteem than they were later and before forced retrenchment in expenditures was necessary.

The Furnaceman and the Founder.

Indications are multiplying that progress in the manufacture of pig iron and in the production of castings will bring the founder and furnaceman closer together and will prove very beneficial to both. The multiplication of foundrymen's associations in this country during the past few years and their activity has done much to stimulate a desire for improvement. Although some of the papers read have been elementary and a part of the discussions have been crude, wide publicity has been given in the technical press to the transactions of these societies because of their important educational influence. It is not too much to say that many of the quaint conceits prevalent among foundrymen have been swept out of existence, and that there is now a wider and better knowledge of facts and a greater and more intelligent eagerness to progress than there has been. Some of the old prejudices linger with characteristic persistence and there is some justification for it, because enthusiasts have often claimed too much for modern methods.

It is probably not too much to say that progress must naturally come from the founder, because the pig iron producer stands to the former in the attitude of the seller to the buyer, whose requirements he must meet, and even whose whims he must cater to. Under such conditions the furnaceman must be circumspect. Yet it is easy to discern in what direction progress is tending.

One of the most serious embarrassments to the use of chemical analysis as a guide to the founder is the fact that only too often the analysis itself does not really represent a fair average of a lot of iron because the sample is not correctly drawn. Furnacemen know perfectly well that there is a very large variation in the composition of the pigs produced in one cast from the furnace and that it is very difficult to get a true sample. Lately the tendency is developing among furnace managers to interpose a ladle between the furnace and the cast house. In other words, the iron is not tapped direct from the furnace into the casting bed, but is first run into a ladle, from which it goes either to a casting machine or to the pig beds. This means, in either case, that the iron in one cast is thoroughly mixed and that there are not the variations in the individual pigs which are now so common.

It is pretty generally understood now that the grain of a pig iron is determined not alone by chemical composition, but that the rate of cooling has an important bearing, often modifying and sometimes completely overriding the effect of chemical composition. We believe that once the uncertainties as to the actual chemical contents of pig iron in a cast are removed grading by fracture will receive its death blow, and then the expensive method of casting into pig beds and handling in the cast house will rapidly disappear.

Quite a number of foundrymen still hold to the conviction that there is some mysterious effect for good in the sand which adheres to the pig iron cast in the bed. They look askance at the iron cast in a casting machine, which has conquered its position in the favor of the steel maker. On what ground sand adhering to pig iron can possibly be anything but harmful in the cupola it is difficult to understand.

We believe that it will not be long before the old fashioned cast house will be a relic of the past, and that then foundrymen will charge clean iron, with a guaranteed analysis, cast in casting machines from a ladle into which the iron has been run either from the furnace or from large mixers which are capable of taking care of more than one cast.—*The Iron Age.*

Corona Steel Ranges.

The Royal line of Corona steel ranges is the subject of a 20-page pamphlet, bound in paper covers, which reaches us from Bergstrom Brothers & Co., Neenah, Wis. It is in the nature of an illustrated catalogue and price-list, and describes the goods in a way to interest the dealer. These ranges were entirely new last season, and since their introduction have proven very popular with the

trade. The body of the range is made of Wood's cold rolled steel plate, closely riveted and lined with asbestos board to retain and force the heat into the oven and protect the highly finished enamel surface outside. The oven is made in four sections. the oven bottom being of extra heavy steel thoroughly braced, so that it will not warp or buckle. The high closet and high shelf are supported on cast brackets, while the high shelf has a balanced roller door of Russia iron and nickel trimmed. The main top of the range is 28½ inches wide, made in four sections with heavy key plates, which can be readily changed to either No. 8 or No. 9. A false or lower bottom is placed underneath the flue bottom to further strengthen the range body and serve to retain the heat in the oven, while at the same time making it impossible to burn the floor. The standard sheet flue construction is provided. The fire box is oval in form with heavy sectional linings, and for coal it has a duplex grate, while for wood it is provided with a heavy flat grate. These can be removed through the grate door without disturbing the fire box linings. Various styles of the Corona are shown accompanied by descriptive particulars and a tabulated price-list.

The Uses of the Blower in the Foundry.*

BY WALTER B. SNOW.

Under the broad term blower may be classed four types of machines, differing widely in their construction and operation.

1. The peripheral discharge fan wheel with inclosing case.
2. The propeller or disk wheel, discharging its air in lines practically parallel to its axis.
3. The so called rotary blower, with close fitting revolving propellers, and
4. The blowing engine, acting upon the principle of the plunger pump, and capable of producing pressures of several pounds to the square inch.

Of these four types, the second, or propeller type, is absolutely valueless for cupola work, because of its inability to produce the required air pressure; while the fourth, or blowing engine type, is too complicated and expensive for use in the ordinary foundry. For all purposes, except blowing cupolas, the fan blower is the only type which is adaptable. Although the rotary blower is to a certain extent employed for this specific purpose, a clear statement regarding the theory and operation of the fan blower, such as it is here attempted to make, should render evident the predominant advantages of the latter type.

According to the purpose for which they are designed, fan blowers may be classed either as volume blowers or pressure blowers, although one type naturally merges into the other. In either type the fan blower proper consists in its simplest form of a number of blades extending radially, or nearly so, from its axis and presenting practically flat suraces to the air as they revolve. By the action of the wheel the air is drawn in axially at the center and delivered from the tips of the blades in a tangential direction. It is therefore designated as a centrifugal fan, or, more properly, as a peripheral discharge fan.

A volume blower is primarily designed to discharge air in large quantity under low pressure with the minimum expenditure of power. This requires a wide and comparatively slow running wheel. A pressure blower, on the other hand, is designed for the purpose of creating a high pressure, which may be as great as 20 ounces per square inch, while delivering a relatively small volume of air. To this end the wheel must be narrow and operated at high speed.

In operation the peripheral discharge fan sets in motion the air within it, which, acting by centrifugal force, is delivered tangentially at the outer circumference of the wheel. Air rushes in at the axial inlet to fill the space between the blades, in which there is, by the centrifugal action, a tendency to form a vacuum. The degree of this vacuum is dependent upon the circumferential speed of the wheel; and the velocity of the air discharged through an outlet of proper size is substantially equal to that of the circumference of the wheel. The fan case thus virtually becomes a reservoir from which the air escapes through the outlet, the proper size of which to produce the above stated results will be discussed further on.

The velocity with which air escapes into the atmosphere from a reservoir is dependent upon the pressure therein maintained and upon the density of the air. The pressure per unit of area divided by the density per unit of volume gives the head, usually designated as the "head due to the velocity." The velocity produced is that which would result if a body should fall freely through a distance equal to this head. In the case of the flow of water such a head always exists; as, for instance, when a standpipe is employed to produce the requisite pressure. Suppose the head of water to be 50 feet and its weight per cubic foot to be 62.5 pounds, then the pressure per square foot will be $50 \times 62.5 = 3125$, and that per square inch $3125 \div 144 = 21.7$ pounds. Its theoretical velocity of flow from an orifice at the bottom of the standpipe would be 56.7 feet per second, as determined by the formula for falling bodies, which is $v = \sqrt{2gh}$, in which v = velocity in feet per second, g = acceleration due to gravity and h = head in feet, here 50 feet. In the case of air, however, an actual homogeneous head never exists, but in its stead we have to deal with an ideal head which can only be determined by dividing the pressure by the density. As the density of air is so much less than that of water it is evident that for a given pressure the head will be far greater in the case of air. But the velocity of discharge is dependent only on the distance fallen which is represented by the head, whether real or ideal. As a consequence, air under a stated pressure escapes at vastly higher velocity than water under the same conditions. Calculated in the same manner the velocity of escaping air under a pressure of 21.7 pounds per square inch is 1626 feet per second. By the employment of formulæ based upon this theory the elaborate basis tables in the Sturtevant catalogues have been calculated.

In the attempt to force air at a given velocity through a given pipe, it is the province of the fan wheel, if employed therefor, to create within the fan case a total pressure above the atmosphere which shall be sufficient to produce the velocity and also overcome the resistance of the case and the pipe. If, however, the pipe be removed and the fan be allowed to discharge the air through a short and properly shaped outlet, the pressure necessary will, with an efficient fan, be substantially that required to produce the velocity. The method of determining the velocity due to any given pressure has just been explained. From the same formulæ, properly transposed, the pressure due to any given velocity or necessary to its creation may be determined. The pressure thus determined is properly that which it is the purpose of a fan, employed as a device for moving air, to create. The velocity of the fan tips or circumference of the fan wheel which is necessary to produce a given velocity of flow through a properly shaped outlet within the capacity of the fan is substantially equal to the velocity of flow. If, therefore, the peripheral velocity of a given fan is known, the resulting pressure for the production of velocity through an outlet of proper size and shape may be readily calculated.

From the basis formula already employed, as well as from the preceding discussion, it is evident that the pressure created by a given fan varies as the square of its speed. That is. doubling the speed increases the pressure fourfold. The volume of air delivered is, however, practically constant per revolution, and therefore is directly proportional to the speed.

The work done by a fan in moving air is represented by the distance through which the total pressure is exerted in a given time. As ordinarily expressed in foot pounds, the work per second would, therefore, be the product of the velocity of the air in feet per second, the pressure in pounds per square foot, and the effective area in square feet over which the pressure is exerted.

From this it is evident that the work done varies as the cube of the velocity, or as the cube of the revolutions of the fan. That is, eight times the power is required at twice the speed. The reason is evident in the fact that the pressure increases as the square of the velocity, while the velocity itself coincidently increases; hence the product of these two factors of the power required is indicated by the cube of the velocity. The theoretical relations between the revolutions of a fan and the volume, pressure and horse-power are clearly shown by the accompanying diagram. These curves are based upon the facts that the volume varies directly as the speed, the pressure as the square and the horse-power as the cube of the speed. Thus it is shown by the curves that if the speed is doubled the volume is also doubled, the pressure is increased four times and the horse-power becomes eight times greater. The tremendous power expenditure required for even a moderate increase of speed is thus rendered distinctly evident.

In selecting a fan the facts just presented should be borne in mind. It appears to be so simple to secure increased volume by running a given fan at higher speed that the influence upon the power required is frequently overlooked. If the necessary amount of power is actually furnished, its expenditure will entail great loss in efficiency as compared with that required to operate a fan properly proportioned to the work.

In the design of a wheel to meet given requirements it is necessary to make its peripheral speed such as to create the desired pressure, and then to so proportion its width as to provide for the required air volume. Evidently the velocity and corresponding pressure may be obtained either with a small wheel running at high speed or a large wheel running at low speed. But if the diameter of the wheel be taken too small it may be impossible to adopt a width, within reasonable limits, which will permit of the passage of the necessary amount of air under the

* A paper read before the New England Foundrymen's Association.

desired pressure. Under this condition it will be necessary to run the fan at higher speed in order to obtain the desired volume. But this results in raising the pressure above that desired, and in unnecessarily increasing the power required. On the other hand, if the wheel be made of excessive diameter it will become more impracticable on account of its narrowness. Between these two extremes a diameter must be intelligently adopted that will give the best proportions for the specific work it is designed to do.

The actual work which a fan may accomplish must depend not only on its proportions, but upon the conditions of its operation and the resistances which are to be overcome. Evidently, it is improper to compare fans when operating under such conditions that these resistances cannot be definitely determined. The simplest and most natural condition of operation is that in which the fan is operated without other resistance than that of the case—that is, with open inlet and outlet. For proper comparison of different fans, the areas through which the air is discharged should bear some constant relation to the dimensions of the wheels themselves.

It has been determined experimentally that a peripheral discharge fan, if inclosed in a case, has the ability, if driven at a certain speed, to maintain the pressure corresponding to its tip velocity over an effective area which is usually denominated the square inches of blast. This area is the limit of its capacity to maintain the given pressure. If it be increased the pressure will be reduced, but if decreased the pressure will remain the same. As fan housings are usually constructed, this area is considerably less than that of either the regular inlet or outlet. It, therefore, becomes necessary, in comparing fans upon this basis, to provide either the inlet or the outlet with a special temporary orifice of the requisite area and proper shape, and make proper correction for the contracted vein. The fan is thus, in a sense, placed in a condition of restriction of discharge, which it approaches in practice only in so far as the resistances of pipes, passages and material through which the air must pass have the effect of reducing the free inlet or outlet of the fan.

The square inches of blast, or, as it may be termed, the capacity area of a cased fan, may be approximately expressed by the empirical formula:

$$\text{Capacity area} = \frac{D\,W}{x}$$

In which D = diameter of fan wheel in inches, W = width of fan wheel at circumference in inches, x = a constant, dependent upon the type of fan and casing.

The value of x has been very carefully determined by the B. F. Sturtevant Company for different types of fans; but these values must be applied with great discretion, acquired through experience and a thorough knowledge of all the conditions liable to affect the fan in operation. An approximate value of x for general practice is not far from 3, but this is to be used only to determine the capacity area over which the given pressure may be maintained. This is not a measure of the area of the casing outlet, which is always larger than the square inches of blast. As a consequence, the pressure is lower and the volume discharged is somewhat greater than would result through an outlet having the square inches of blast for its area. But the maximum pressure may be realized when the sum of the resistances is equivalent to a reduction of effective outlet area to that of the square inches of blast. Both the volume and the power required will evidently increase with the area of the outlet, being greater with the normal outlet than with that representing the capacity area. But this increase will not be proportional to the area; for the greatest delivery of air and the largest consumption of power will occur when the casing is entirely removed and the fan left to discharge entirely around its periphery.

Although the theoretical considerations which govern the design of fans have here been given, the conditions which exist in any given case must enter into any decision as to the practical dimensions to be given the fan. If volume alone, regardless of pressure, is the requisite, the larger the fan the less the power required. There is a strong temptation, however, for a purchaser to buy a smaller fan and run it at a higher speed; for he sees only the first cost and does not realize the entailed expenditure for extra power. If possible, a fan should never be made so small that it is necessary to run it above the required pressure in order to deliver the necessary volume. To double the volume under such conditions requires eight times the power. Three times the volume demands 27 times the power.

For certain purposes, such as the blowing of cupola furnaces, a comparatively small volume of air is required, but under high pressure. For exhausting, blower boiler fires and the like, the volume required is greater and the pressure relatively less. The former wheel requires to be narrow at the circumference, thus providing for the escape of only a small amount of air When a fan is employed for exhausting hot air or gases, the speed required to maintain a given pressure difference is evidently greater than that necessary when cold air is handled, the difference being due, and inversely proportional to the absolute temperature.

The preceding discussion, relating as it does to theoretical features of design and operation, has of necessity taken on a somewhat abstruse and, I also fear, a decidedly uninteresting character. But its presentation has appeared to be desirable because of its importance. We may now turn to the different types of fan blowers employed in the foundry and consider them in a somewhat more practical manner. First of all is the pressure blower, for blowing the cupola, so familiar to you in the form of the Sturtevant steel pressure blower. The extreme length of the bearings and the special arrangement for keeping them well supplied with oil are among the most important features which have made possible the continued employment of blowers of this make for fully a third of a century with practically and in many cases with absolutely no expense for repairs. The fan wheel is narrow, with tapering sides, reducing to the minimum width at the outer circumference where the air escapes from the wheel into the surrounding case. Numerous curved blades or floats serve, by their continuous action, to prevent the return of this air to the wheel center and thereby

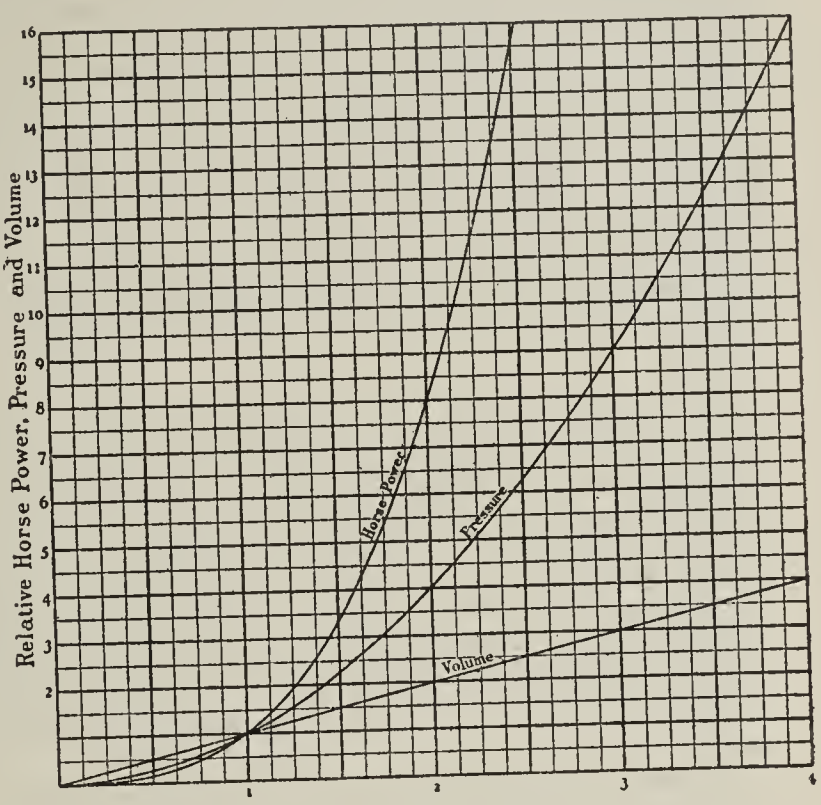


Fig. 1.—Theoretical Relation Between the Revolutions of a Fan, the Volume Discharged, the Pressure Created and the Horse-Power Required.

maintain the pressure due to their tip velocity. From what has previously been said, it must be evident that even a slight change in the width of the tip of the blade of such a narrow wheel must have a marked effect upon the volume of air which is discharged and upon the power which is required to accomplish this result. For this reason blowers cannot be compared by the areas of their casing outlets, but only by their capacity areas, as determined by the proportions of the wheels.

The general application of a pressure blower to a cupola is too well known to require description, but certain features which relate to its efficiency may well be considered here. The proportions of a pressure blower wheel should theoretically be such that its capacity area or square inches of blast shall be practically equal to the free area through the fuel and iron in the cupola, less the influence of the resistances of piping, tuyere boxes, fuel and iron. These resistances are evidently the equivalent of just so much reduction in area, and must therefore enter into any consideration. But it is manifestly true that differences in the length and arrangement of piping in different plants and of size, quantity and character of the charges in the same plant, introduce such variable conditions that it is impossible to design a blower of any type that shall at all times be just exactly proportioned to the work to be done. For this reason the exact power required to operate any given blower cannot be given as an absolute quantity, but can only be determined when all of the conditions are known. It is, or at least it should be, customary in specifying the pressure required to operate a cupola, to refer to that in the wind box. On the other hand, the table of blower speeds presented in the Sturtevant catalogue gives the number of revolutions necessary to produce the given pressure at the fan outlet when its area is within the capacity of the blower. Owing to losses due to transmission, this pressure cannot be maintained at any more or

less distant point, such as the wind box of the cupola, unless the speed of the fan is increased sufficiently to produce an excess of pressure equal to the transmission loss. It is the failure on the part of the purchaser to comprehend this fact and to make due allowance for transmission losses, that sometimes results in too low a pressure at the cupola, and an unjust charge against the blower. Large, straight and short connections from blower to cupola are always imperative if waste of power is to be avoided. If changes in the direction of the piping are necessary, they should be made with as large a radius of curvature as possible. It should be distinctly understood that the power required to operate a fan blower is proportional to the area of discharge. If this area be reduced to zero by the closing of the blast gate, the power will be reduced to merely that due to the friction of the machine and of the air confined within the case. Too often it is claimed by those who ought to know better, that closing the pipe increases the power, but as power is expended only when air is moved, the fallacy of this statement is evident. This fact points to one of the prominent economic advantages of the fan blower, viz., its automatic action. Instead of always delivering a fixed volume of air, regardless of requirements, the fan blower automatically increases the volume as the resistances are decreased. On the other hand, if the fan blower be in operation with a fairly free outlet, in excess of its capacity area, and that free area be decreased, the pressure produced by the fan will immediately rise, thus tending at once to overcome the increased resistance. Therefore, if a certain maximum pressure is known to be required in a given cupola, the fan may be so speeded as to give this at such times as the conditions demand. While at other times, when less pressure or volume of air is required in the cupola, proper manipulation of the blast gate will economize power. Compared with a type of blower like the rotary, in which a certain maximum pressure and volume must always be maintained, and a portion allowed to waste if not required, the economic advantage of the fan blower is evident.

In the matter of first cost the fan blower is, for the same capacity, only about one-quarter as expensive as the rotary blower and weighs on the average only about one-ninth as much. This latter feature is of the greatest importance, particularly in the case of large plants. For with the fan blower expensive foundations and high freight charges are avoided, while the handling of parts for repairs is rendered far easier. In the matter of efficiency under the same conditions, the fan blower has been shown by impartial experiment to be superior, while in general endurance, in lack of danger of breakage and of leakage due to wear it may be fairly claimed to take the lead.

We may now turn to other uses of the fan blower in the foundry—uses in which it has no practical competitor. Employed as an exhaust fan and properly designed for its work, it has found an extended application for removing the dust from tumbling barrels, from emery wheels, and, in fact, for exhausting dust, smoke or objectionable gases from any machine or apartment in which they are generated. For such work the fan is driven at comparatively low speed and proper connection made to the space or spaces from which the objectionable matter is to be drawn. This passes through the fan and thence to any desired place of deposit and is discharged into the open atmosphere.

In the case of the pattern shop, which usually forms an adjunct of the foundry, a fan of this type in the form of a planing mill exhauster is always of advantage for the removal of shavings and sawdust. The width of the wheel in such a fan is far greater both at inlet and outlet than that of a pressure blower wheel. A large volume of air at comparatively low pressure is thus passed through the fan with a minimum expenditure of power.

A similar type of fan on a larger scale is used in connection with a steam pipe heater for the heating and ventilation of the model foundry. By the concentration of all of the pipe in a single heater across which large volumes of air are caused to pass, the amount of pipe is reduced to from one-third to one-fifth of that which would be required if it were strung around the foundry, as in the case of direct radiation. This concentration of the heating surface also serves to reduce to a minimum all possibility of freezing, renders the regulation of temperature as simple as is possible, and presents numerous other advantages. The general form of this apparatus is shown by the accompanying cuts. The heated air is distributed by means of the fan through a more or less extended system of underground ducts with vertical wall flues or of overhead galvanized iron piping. The large quantity of air thus supplied secures adequate ventilation, causes all air leakage to be outward and serves to keep the foundry comfortable and clear of gas and steam during the heat, if cool or slightly tempered air be then supplied.

A similar form of apparatus, designed to deliver air at high temperature, may be employed for keeping cores dry. It is also used for drying flask and pattern lumber, when the quantity is sufficient to warrant the arrangement.

Although the boiler plant in connection with an independent foundry is usually of somewhat limited size, nevertheless the fact should not be overlooked that the fan blower is rapidly usurping the place of the chimney in the production of draft or serving as its assistant in securing desired results. Applied to force the air into a closed ash pit it creates a pressure which makes possible a high combustion rate, the burning of cheap fuel and the attainment of the maximum capacity of the boilers. Employed as an exhauster, through which the gases are drawn, it in addition does away with the necessity of a high chimney. Under either form of application perfect control may be maintained over the draft pressure, and it may be automatically increased or decreased coincidently with a slight fall or rise in the steam pressure, which thus remains almost absolutely constant.

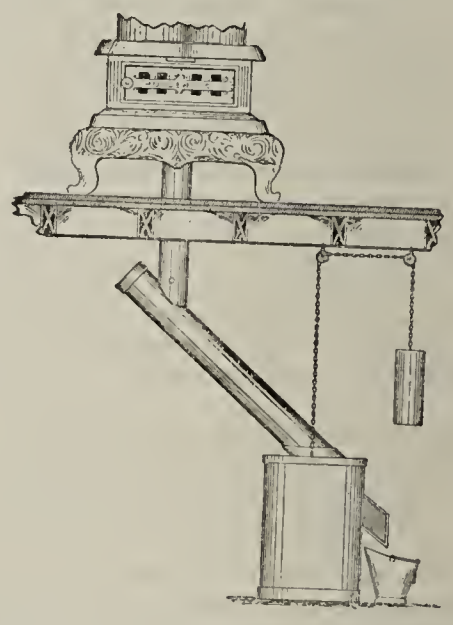
Such, then, are some of the uses of the fan blower in the foundry. Either as a convenience or as a necessity it is ever in demand, and its forms of application are constantly increasing. It therefore stands to-day as a specific type of machine whose general advantages and peculiar adaptability are becoming more and more familiar to every manufacturer and engineer.

False Rumor of Stove Combination.

The trade was startled this week at a report originating in Chicago, to the effect that a combination of important stove manufacturing interests had been effected with a view to advancing prices. The account was most circumstantially worded, giving the names of six prominent stove concerns, including the Michigan, Detroit and Peninsular Stove Companies, and went on to say that the advance would take place within 60 days, giving the amount, &c. How the report originated it is difficult to say, for there appears to be not a word of truth in it, each of the Detroit concerns contradicting it flatly, the Michigan Stove Company branding it as a deliberate lie and asking that a prominent and elaborate denial be given to the malicious and sensational account.

The Campagna Ash Remover and Automatic Sifter.

The trade will be interested in the device illustrated herewith known as Campagna's combined ash remover and automatic ash sifter, made by Eugene W. Campagna, West street, Randolph, Mass. The device serves as an ash remover, and the sifting is done by gravitation. The ashes in the stove are set in motion by a movable damper, operated by a sliding rod and worked from under the stove. On this damper are two small arms which throw the ashes into an inclined chute, and which sifts them



The Campagna Ash Remover and Automatic Sifter.

automatically and delivers them into a metal barrel, partitioned so that one side receives the cinders and the other the ashes. On the side containing the cinders is a small door from which they may be taken daily if desired. The ashes can be emptied when the barrel is full, generally about once a month. If for any reason the sieve is clogged, there is a rod at the top of the inclined chute connected with a spring which by pushing in a few times will remove any obstructing substance.

At the annual meeting of the stockholders of the Yale Gas Stove Company, New Haven, Conn., held last month, it was decided to wind up the affairs of the company and to ask the court to grant a receiver.

ODD PLATES.

At a recent meeting of the Union Relief Association of the Union Stove Works, held at Liberty Hall, Peekskill, N. Y., the following officers were elected for the ensuing year: President, James Tice; vice-president, Philip H. Smith; secretary, Samuel H. Tate; treasurer, Edward F. Hill, and assistant treasurer, D. C. Hasbrouck.

The Schuylkill Valley Stove Company of Spring City, Pa., recently held their annual meeting and elected J. Howard Richards president, Henry Eppeheimer vice-president, John W. Gebhart secretary and W. F. Stephens treasurer. These officers, with Andrew McMichael, Thomas G. Taylor and L. L. Eisenhower, constitute the Board of Directors for the ensuing year. The first five named are residents of Spring City, while Mr. Taylor and Mr. Eisenhower are citizens, respectively, of Phœnixville and Reading.

The North Dighton Co-operative Stove Company of North Dighton, Mass., resumed operations in their molding shop on the morning of January 25, and the following day work was resumed in the mounting shop. At the annual meeting of the stockholders George H. Reed, Frank K. Chase, Daniel Crotty, William B. Babbitt, John F. Driscoll, Henry H. Lincoln and Joseph Norris were elected directors. The directors elected George H. Reed president and Frank K. Chase treasurer.

At the annual meeting of the Carton Furnace Company, Utica, N. Y., the following directors were elected: E. A. Carton, W. J. Carton, John B. Jones and S. A. Batley. At a meeting of the Board of Directors E. A. Carton was chosen president and general manager, W. J. Carton vice-president and treasurer, John B. Jones secretary and George W. Jones superintendent of works.

At the annual meeting of the stockholders of the Bloomington Stove Company, Bloomington, Ill., the old officers were re-elected, together with the following directors: William Van Schoick, E. H. Miner, Henry Chrisman, Henry Heyer and Montgomery Evans. The latter is a new member, succeeding his father, J. W. Evans, who was one of the directors ever since the company were formed. The reports presented showed the concern to be in a prosperous condition.

The Portsmouth Stove & Range Company of Portsmouth. Ohio, contemplate increasing their molding facilities by an extensive addition, plans for which have just been prepared. The extension will be made 65 feet east of the end of the present room and extend 100 feet south toward Gallia street. The company are doing a large business and the increased facilities have become necessary as a consequence.

The Rock Island Stove Company of Rock Island, Ill., have recently opened a branch house at Kansas City, Mo., which will be under the management of George W. Blakeslee.

The annual meeting of the stockholders of the Co-operative Stove Company of Bloomington, Ill., was held at the office of E. M. Hamilton on the evening of Tuesday, January 25. After listening to the report of the superintendent, the following directors were elected: H. Capen, E. Hamilton, John W. Hayes, George F. Parker, A. C. Hamilton, E. C. Hewett, George Brand, Sr., C. A. Hamilton, E. E. Donnelly, Frank Riegger and Otto Seibert. At a subsequent meeting the directors elected John W. Hayes president, E. E. Hewett vice-president, E. M. Hamilton secretary and Arthur C. Hamilton treasurer and superintendent.

We are indebted to the Peninsular Stove Company, Detroit, Mich., for a copy of their little leaflet called "The Peninsular," the first number of which appeared in January, and which, we understand, they intend to publish every month. It is a little four-page publication measuring 5 x 6½ inches, and has a good deal to say in the interest of the Peninsular Furnaces, Stoves and Ranges. We have no doubt that any one desiring to see a copy of this little journal or to get it regularly can do so by addressing the Peninsular Stove Company.

At a recent meeting of the stockholders of the Portsmouth Stove & Range Company, Portsmouth, Ohio, Frank V. Knauss, Lewis W. Baker, W. Scott Todd, Lewis M. Knauss and Edward J. Corson were elected directors for the ensuing year. At a subsequent meeting of the Board of Directors F. V. Knauss was chosen president, L. M. Baker, vice-president and W. S. Todd secretary and treasurer.

At the annual meeting of the stockholders and directors of the Excelsior Steel Furnace Company, held recently at the Chicago office of the company, the following officers were elected: President and treasurer, A. W. Glessner; secretary, J. A. Haben; superintendent, A. G. Scherer. The report of the president, covering the business of the corporation for the year 1897, showed a very satisfactory condition of affairs. The percentage of increase in the volume of sales over the preceding year was large, and while prices were very low, and the returns on the invested capital meager, the report showed that substantial progress had been made and the future was considered encouraging.

The trade and navigation returns of Canada, just published, for the fiscal year ended June 30, 1897, show the total value of Stoves imported into the Dominion from the United States to have been $67,406, an increase of $13,000 over the previous year, notwithstanding the increased duty on these articles.

The Quick Meal Company of St. Louis, Mo., have published an interesting little pamphlet of 16 pages, the matter of which has been prepared especially for the woman of the house. It tells her how to save time, work and worry, and how to prepare a Quick Meal and eat it in comfort. It is in substance an illustrated description of the Quick Meal Stove, in which the important features are pointed out, the advantages which it possesses enumerated and directions given for successfully operating it. There are also given a number of testimonial letters from some of those who have used the Quick Meal Stoves. The printing is in colors, and the binding is in attractive covers carrying a *fac-simile* of the company's trade-mark.

Werner B. Heideloff, brother of J. J. Heideloff, of Somerset street, Plainfield, N. J., has constructed an exact representation of the Danville Stove Company's foundry in Danville, Pa., and has placed it in the show window of his brother's store. The model is a complete one in every way. In front upon a track runs a train of cars drawn by a miniature engine which goes by steam. The foundry and other buildings are lighted at night by electricity and look true to life. The display is a creditable one, and is an excellent specimen of the inventive genius displayed by Mr. Heideloff.

The strike which was recently inaugurated at the works of the Mountain City Stove & Mfg. Company, Chattanooga, Tenn., came to an end on the morning of Monday, January 31, when the men returned to work under what is said to have been practically the old arrangement.

The Lehigh Stove & Mfg. Company of Lehighton, Pa., have made a number of important improvements in their works since the first of the year, prominent among which may be mentioned the installation of an electric light plant, which embraces a 10 horse power dynamo, furnishing 125 electric lights scattered through various departments of the several buildings. Other improvements include a new nickeling department, also more room for Stove mounting purposes and a steam heating apparatus. They are, we understand, now working full time with a good supply of orders on hand. Mr. Smith, the superintendent, is enthusiastic about the work, and predicts great things for the ensuing year.

Cook & Van Evera, 171-173 Lake street, Chicago, Ill., favor us with an illustrated folder which they are distributing, calling attention to the Jersey Stoves and Ranges. These are offered in many styles and sizes, some being adapted for coal and wood and others for wood only. The line also embraces the Jersey Steel Range, which is made of the best quality of material, is asbestos lined throughout, has removable duplex grate for coal or wood, and an oven which is thoroughly braced, bolted and ventilated.

A Severe Furnace Test.

In one of the political campaigns a few years ago a New York paper, whose vocabulary had a world wide reputation, referred to one of its disesteemed contemporaries in an indirect way by saying that when the procession passed the latter's office there was a noticeable odor of "underdone sewage." It was a rather bold figure of speech to use, and while it conveyed a very strong impression to the mind, it was hardly an impression that could have been based upon any experience in the life of the writer.

The story is brought to mind by something that happened quite recently in Denver, Col., where in a school house, the furnace of which has been recently repaired, a number of scholars in one of the rooms were made sick by the stench that came up the registers. The newspapers in exploiting the matter said that the furnace was set in brickwork that had been used for cesspool walls. We wrote to Principal J. H. Dodds of the school, and learned from him that the newspaper reports were grossly exaggerated, that the bricks had not been used in a cesspool, but had, however, been formerly used in the construction of the walls of a system of dry closets. These bricks had become saturated with urine, and although they had not been in use for three years the heat of the furnace caused them to send forth fumes, which got into the school room, making a number of the pupils sick. The mistake was made by a man employed to do the work, and as soon as the Board of Education learned of the condition of things the school was closed and the offensive bricks were removed and replaced with clean material.

TRADE REPORT.

METAL MARKET.

Pig Tin.—There has been gradual but steady improvement in prices for Straits Tin, despite the heavy shipments from Singapore last month and somewhat heavier arrivals here. The latter have amounted to 440 tons since the beginning of the month. About 2700 tons, as far as can be learned, are in transit to the United States, but a good portion of this was sold prior to arrival, with no small part going almost directly into the channels of consumption. Wholesale prices have stiffened about ½c., and there has been a corresponding advance in retail quotations. Small lots from store now sell here at 14½c. to 15c. per lb. Dealers report a fair current volume of business, with inquiries indicating a considerable consumption, present and prospective.

Copper.—Purchases by the export trade have been fairly large, and still serve to counterbalance the natural effect of what may be considered phenomenal American production. In any event, wholesale prices are held up firmly and the retail market has a stronger tone also, although sales have been of merely an ordinary type. Dealers' prices for small lots from store rule at 12¼c. per lb. for Lake Ingot and 11¼c. for Ansonia Grade Casting Copper.

Sheet Copper.—The improvement in this department continues. Gradually, but slowly, business is expanding, and orders are coming in more freely. Prices display more firmness and there is an absence of the radical cutting which demoralized the trade awhile ago. The outlook is regarded cheerfully in the trade, as inquiries point to a probable large consumption of Sheet Copper this year. Dealers' quotations are by no means uniform, but 15. per lb., basis, is probably a fair average rate for small lots from stock.

Pig Lead.—Considerable effort has been made to give the market a stronger appearance, and to a certain extent it had somewhat encouraging effect. Evidence is wanting, however, that the larger consumers have purchased otherwise than in a very conservative way, and there is no sign of remarkably lively interest on the part of jobbers. There has been some speculative inclination, but only small actual ventures. In a retail way business shows a slight improvement and dealers are more encouraged, but prices have not changed from recent low quotations. Small lots of American Pig from store sell at about 4⅛c. per lb

St. Louis advices are as follows: Pig Lead has been quite active during the past week, and prices are decidedly firmer. Consumption is showing a steady increase and higher prices are anticipated.

Spelter.—Offerings at exceptionally low prices that were made during the fortnight preceding the week under review have been withdrawn, and the indications are that really cheap lots are not easy to obtain at the moment, despite the large and growing production. A firmer tone is apparent in the retail trade, where sales have been somewhat more free, and jobbers' prices are strong at 4½c. per lb. for small lots of good Western brands.

St. Louis advices are as follows: Smelters are nearly a unit in maintaining recent prices and report a heavy trade. There is no apparent effort being made to advance prices, and no change in prices is anticipated.

Antimony.—Business of very fair volume is passing in a jobbing way and prices for small parcels are firm at 7¼c. for Japanese, 7½c. for Hallett's and 8½c. for Cookson's.

Nickel.—Sellers' price for small lots remains at 38c. per lb.

Tin Plate.—Alone among the metals Tin Plates show not the least sign of improvement. The market has been extremely quiet, only a scattering business of no special importance having been effected. It is understood that a number of large consumers are waiting to place their orders, but are disinclined to do so until they can learn something more definite about the outcome of the consolidation negotiations now on foot. The uncertainty engendered by the recent meetings and consultations of the manufacturers' committee with makers and leading dealers tends to make buyers nervous about placing contracts at the present time, notwithstanding that the prices offered by some of the mills for present and forward deliveries are as attractive as they have ever been. The rumors floating around regarding the plans of the consolidation projectors are many and various, and the subject is one of interested discussion in the trade. It is known that the committee of four are still working actively to bring the scheme to a successful issue, but their mission to New York last week does not appear to have had any satisfactory results, so far as the local dealers are concerned, and the center of their operations has now been transferred further west. The ideas of the committee are understood not to have met with favor here, being regarded as too magnificently grand for the "effete East." Nevertheless, the plans proposed are enthusiastically supported by a large section of the mills and there is a strong feeling that the plans of consolidation will ultimately be carried out, with material modifications probably. It is a curious fact, however, that some of the interests supporting consolidation are among those that are offering their product for extended delivery at remarkably low prices. To this extent their faith is certainly not shown by their works. There is a fair amount of retail trade passing, but it is not time to look for much activity in this line yet. The prospects, however, are encouraging. Jobbers' quotations show no appreciable change. Small lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are quoted about as follows, but these rates are not uniformly maintained: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., 3.40 to $3.50; do, 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates remain quiet and prices are largely nominal.

Sheet Iron.—The demand for Black Sheets from mill is quite large, and prices are reported to be firm. Many mills are so well booked up for some time to come that they are not inclined to enter any more orders, believing that they will be able to get more money for their product within the next month or six weeks. There is a heavy demand for Galvanized Sheets also, some mills being practically sold up for the next two months. Spot orders are becoming harder to fill. Local jobbers report a moderate demand for both Black and Galvanized Sheets, with no radical change in prices, although cutting is not so common as heretofore. Small lots from stock are quoted at about 2 40c. for No. 27 Common Black Sheets and 75 and 10 and 5 per cent. off for Galvanized.

Chicago advices are as follows: Excellent orders are being entered by some concerns both for Black and Galvanized. Prices seem to be firmly held on Black Sheets. Manufacturers of Galvanized Sheets have been attempting to advance prices. Jobbers are firmly holding small lots of Black Sheets from stock at 2.30c. to 2.40c., but Galvanized Sheets are in abundant supply in the hands of some jobbers and sales of small lots are made as low as 80 and 2½ to 80 and 5 per cent. off.

Old Metals.—The demand for Scrap Bars and Copper for export remains good, and domestic consumption is on a fairly liberal scale. Scrap Iron is moving slowly, as buyers' ideas of values and those of sellers show considerable divergence. Dealers in this city and vicinity are paying about the following rates for moderate sized lots, delivered here:

Heavy Copper	per lb.	9¼c.
Light and Tinned Copper	per lb.	8¾c.
Heavy Brass	per lb.	6 c.
Light Brass	per lb.	5 c.
Lead	per lb.	3¼c.
Tea Lead	per lb.	3 c.
Zinc	per lb.	2½c.
No. 1 Pewter	per lb.	8 c.
No. 2 Pewter	per lb.	4½c.
Wrought Scrap Iron, per gross ton		$10 50
Heavy Cast Scrap, per gross ton		9.25
Stove Plate Scrap, per gross ton		5.25
Burnt Iron, per gross ton		5.00
Tin Plate Scrap, per ton		3.75

The Enterprise Boiler Company, Youngstown, Ohio, now manufacture galvanizing kettles, build galvanizing plants and also erect complete outfits for tinning cast iron. Their process for galvanizing is referred to as making it possible for those who have a limited amount of work to do it themselves at a very low cost. The Enterprise Boiler Company are also manufacturers of boilers, stand pipes and heavy plate work of all kinds.

THE IRON MARKET.

The event of the week has been the purchase by a leading Pittsburgh interest of considerable blocks of Pig Iron. Our Pittsburgh correspondent places the quantity at 70,000 tons, but there is a well founded report that the quantity is close to 130,000 tons. Another very large interest is known to be in the market, whose requirements amount to about 100,000 tons in spite of their own very heavy production. Although independent furnace interests in the Central West are known to have accumulated a good deal of Bessemer Pig during the past few months, it looks as though the whole Central West may be pushed for Iron later in the year. That seems the conviction among some of the largest consumers themselves.

Under the purchases referred to the market for Bessemer Pig in the Valleys has advanced to $9.50, with some holders demanding higher prices.

Judging from the prices at which Southern Irons have been pressed for sale lately, the market needs some good tonic. Whether a "gentleman's agreement" among the Alabama producers will supply it remains to be seen. Virginia, Eastern Pennsylvania and other districts have been competing at a lively pace lately, and thus far have shown no disposition to modify their tactics.

In Lake Superior Charcoal Iron the fight is raging still, with the result that the low figures made are tempting buyers, so that a considerable business has been done. In some instances $11 at Buffalo has been shaded.

Steel Billets continue quiescent, but a stronger tone has developed since the upward movement in Bessemer Pig. The smaller consumers are crowding deliveries, but the large buying interests are still maneuvering for position.

The volume of business in Plates, Bars, Sheets and Wire shows signs of expansion. If spring, with its swelling tide of orders, follows its usual course, then there may be some good hope for better prices.

Pig Iron.—The New York market continues in an unsatisfactory condition, particularly so far as prices are concerned. The volume of buying is quite good, but the tone remains weak. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $10.75 to $11.25; No. 2 Plain, $10.50 to $10.75. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10 25 to $10.75; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

In the Chicago Pig Iron market local producers report a satisfactory volume of business and prices are firmly maintained. Orders offered at even slight concessions are stated to have been refused, as producers are so well supplied with orders that they feel thoroughly independent. Good prospects are reported for a continuance of the demand. Southern sales agents have also had a good trade during the past week, with more inquiries in hand. It is expected that prices on Southern Irons will be advanced 25c. per ton this week. The Birmingham producers have held conferences recently and are reported to have come to such an agreement. We quote for cash as follows:

Lake Superior Charcoal	$11.50 to $13.00
Local Coke Foundry, No 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.35 to 10.60
Southern Coke. No. 3	10.10 to 10.30
Southern, No. 1 Soft	10 85 to 11.00
Southern, No. 2 Soft	10.35 to 10.60

Philadelphia advices indicate no improvement in the Pig Iron situation at that center. A considerable amount of Iron is being taken in one way or another, but efforts that are being made to push sales is evidence that holders are not meeting with the demand that they would like to have. There has been a great deal of irregularity during the past week; in fact, uniform quotations no longer exist—what one man's prices may be is no rule for another. There are no signs of immediate recovery from present conditions, but by the end of the month the chances are that the demoralization will have run its course. Some good sized lots have been taken, including a sale of 1500 tons of Schuylkill Valley Iron for the Pacific Coast, which is quite a new departure. Prices are hard to quote, but the usual range for seaboard deliveries are about as follows, with the usual freight differences at points south or west: No. 1 X Foundry, $12 to $12.25; No. 2 X Foundry, $10.75 to $11.25; No. 2 Plain, $10.50 to $10.60.

The market for Bessemer Pig Iron has been stiffened in the Pittsburgh district by the purchase of a large block of Iron by the Carnegie Steel Company. Quotations are as follows, f.o.b. Pittsburgh: No. 1 Foundry, $10.40 to $10.50; No. 2, $9.90 to $10; Bessemer, $10.15.

Business in Southern Pig Iron in the Cincinnati market has been a trifle duller throughout the past week than during the week previous. Sales of and inquiries for round lots have been discontinued pretty sharply. There is a run of small and medium orders, which, on the whole, is fairly satisfactory and which if continued would leave but little room for pronounced grumbling. Buyers, however, are showing a decided disinclination to lay in stock, and are as a rule buying only with the view of providing for actual necessities. Local authorities think that higher prices are out of the question at present, and that the most that can be done is to hold the market firm on present basis. The market for Northern Irons has been fairly active with no material change in price-lists. We quote, f.o.b. Cincinnati :

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.25 to 9.50
Southern Coke, No. 3	9.00 to 9.25
Southern Coke, No. 1 Soft	9.50 to 9.75
Southern Coke, No. 2 Soft	9.25 to 9 50
Southern Coke, Gray Forge	8.75 to ....
Southern Coke, Mottled	8.75 to .....
Ohio Silvery, No. 1	12.00 to 12.50
Ohio Silvery, No. 2	11.50 to 12.00
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00
Tennessee Charcoal, No. 1	13.00 to 13.25
Tennessee Charcoal. No. 2	11.50 to 12.00

The volume of Pig Iron business in St. Louis during the past week has been quite satisfactory. Some fairly large lots have been taken, but it is intimated that prices were shaded to secure the business. It is peculiar that prices should weaken, especially as stocks are lighter than they have been for many months, and in addition many furnaces sold up several months ahead. Until the furnaces looking for business have their order books filled, however, any improvement in prices seems out of question. We quote as follows for cash, f.o.b. cars St. Louis :

Southern, No. 1 Foundry	$10.25 to $10.75
Southern, No. 2 Foundry	10.00 to 10.25
Southern, No. 3 Foundry	9.75 to 10.00
No. 1 Soft	10.00 to 10.25
No. 2 Soft	9.75 to 10.00

CHICAGO REPORT.

Scrap.—A lively demand is in progress. Large sales have been made. Cast Scrap is hard to get. Yard dealers' buying prices are as follows, Chiago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	7.50	....
Malleable Cast	6 50	...
Stove Plate (free of burnt)	5.50	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8¾c.
Copper Clips	....	9¼c.
Red Brass	....	8 c.
Yellow Brass	....	6¾c.
Light Brass	....	4½c.
Pipe Lead	....	3.10c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—Trade is fair. The ruling prices of carload lots of 12 tons minimum are as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	7.00	7.25
Council Bluffs, Iowa	7.00	7.25
Lincoln, Neb	7.15	7.40
Sioux City, Iowa	7.50	7.75
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.65
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.00	7.25
Davenport, Iowa	6.30	6.65
St. Joseph, Mo	7.00	7.25
Leavenworth, Kan.	7.00	7.25
Omaha, Neb	7.00	7.25

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

The Baldwin Locomotive Works of Philadelphia have chartered a steamer to carry 22 locomotives to Finland.

THE HARDWARE TRADE.

The Hardware market presents few new features this week. The demand is setting in apparently a little earlier than usual, and more business is doing in heavy goods, which are moving in fair volume for the time of the year, and also in general Shelf Hardware. The weather and the condition of the roads have in some sections interfered somewhat with trade. Prices are without important change, but in some lines the market is stronger than it has been. Collections are generally referred to as giving little cause for complaint.

Advices from Chicago.—Jobbers report a fair movement of Shelf Hardware, but the volume of business is probably affected by the soft weather, which is making country roads almost impassable. Orders for future delivery are being booked freely for Poultry Netting, Wire Cloth and similar goods, but advance orders for Refrigerators and some other House Furnishing Goods are rather slow. A better movement has taken place in Tinware, especially small goods. A marked improvement is felt in Aluminum Ware, following the recent slight reduction in price. Excellent orders have been received for such goods from the Pacific Coast for Alaskan prospectors. Gold Pans are still in heavy demand for this trade, and Aluminum Gold Pans are now being called for. A striking feature of recent business has been the number of orders which have been received by Hardware jobbers for new stocks. They state that more orders of this kind have been received in the past 30 days than for a long time previously. The conditions are apparently deemed propitious for new ventures in the Hardware business.

Advices from St. Louis.—The Hardware business during the month of January was extremely gratifying, and the volume of, business for the present month gives promise of being quite as heavy. Reports from traveling men continue to be satisfactory and give promise of a continuance of the present activity. The territory tributary to St. Louis is in excellent condition. Dealers report a plenitude of money in the hands of their customers, and state that buying is much heavier at this season of the year than usual. Prices, while they do not show any material change, are, generally speaking, firmly maintained, and while there are no advances to note, yet on the other hand cut prices are few and far between. Collections are excellent.

NOTES ON PRICES.

Wire Nails.—Since the advance announced in our last issue the Wire Nail market has been characterized by a firm tone and a somewhat increased volume of business. With the progress of the season the trade are naturally buying a little more freely, and those whose stocks are low have been stimulated in placing orders by the strength of the market and the higher prices now in force, with the prospect of another advance next month if the plans of the manufacturers are carried out. The New York price for small lots of Wire Nails from store is $1.70 to $1.75.

Advices from Chicago.—Trade in general shows a marked improvement. The spring demand now appears to have set in, judging from the reports of increased business in every direction from jobbers as well as manufacturers. Orders are said to show no tendency to speculate, being for quantities which indicate a legitimate demand. The Chicago jobbers are selling small lots at $1.60, but will evidently have to mark up their prices at an early day.

Advices from St. Louis.—The prices agreed on by the manufacturers at the recent meeting in Pittsburgh are being firmly maintained. Mills report a heavy trade. Jobbers are busy, and quote $1.65 to $1.70 for less than carload lots.

Cut Nails.—The Cut Nail market is in substantially the same condition as a week ago. Small lots from store are quoted at about $1.30.

Advices from Chicago.—Nothing new has occurred in Cut Nails, small lots being still sold at $1.45.

Advices from St Louis.—The demand for Cut Nails is fairly satisfactory, but the prices at present quoted by some mills indicate that they are looking for business. Jobbers ask $1.40 to $1.45 for small lots from store.

Barb Wire.—The Barb Wire market has a decidedly firm tone and the higher prices recently determined upon by the manufacturers are well maintained.

Advices from Chicago.—A very good demand is reported by manufacturers and jobbers, showing that the regular spring demand is now beginning to be felt. Manufacturers occupy an exceedingly good position for advancing prices, as they have absolutely no stock on hand and the demand is steadily increasing. Jobbers have not yet advanced their prices on small lots, although it is probable that this will be done during the coming week. The St. Paul and Minneapolis jobbers have advanced their prices 10 cents, to correspond with the manufacturers' price.

Advices from St. Louis—The demand for Barb Wire is heavy and has set in earlier than usual. Mills have no large stocks to draw from and jobbers, as a rule, are only moderately well supplied. Farmers who have deferred buying Wire for the past two or three years are now in position to purchase what they need, and the increased business which the mills are enjoying is pretty good evidence that these orders are now being placed. Jobbers report a large trade and quote Painted at $1.70 and the usual advance for Galvanized.

Smooth Wire.—The market for Smooth Wire is steady and firm at about $1.35 for small lots from stock.

Shot.—As a result of the condition of the Pig Lead market, the Eastern Shot manufacturers have reduced their quotations on Shot, naming, under date February 7, the following prices, subject to a discount of 2 per cent. for cash in ten days, and the usual discount in ton lots:

Drop Shot, sizes smaller than B, per 25-pound bag	$1.17
" " " " " " " 5 " "	.30
" " B and larger sizes, per 25-pound bag	1.42
" " " " " " " 5 " "	.35
Buck Shot, per 25-pound bag	1.42
" " " 5 " "	.35
Chilled Shot, per 25-pound bag	1.45
" " " 5 " "	.35
Dust Shot, per 25-pound bag	2.00
" " " 5 " "	.50

Glass.—The Glass trade is devoid of new features, and lack of business is one complaint of local jobbers. It is reported from factories that demand continues good, but the promptness with which orders are filled would indicate that the supply was fully commensurate with requirements. The trade look with more or less distrust upon the stability of present prices, as is evinced by the holding back of orders. Merchants appear to think that as these are association prices they are not likely to stand in the face of limited consumption. The discount of 85 and 10 per cent. is still obtainable in small lots in the local market.

White Lead.—There has been about the full average business in both Lead in Oil and Dry White Lead, but no unusual movement and prices remain stationary, since there is no serious opposition to the leading consumers nor influential change in the market for base materials.

Red Lead.—Red Lead, of both domestic and foreign make, is steady at prices that have prevailed for some time past, and there is quite good general movement for the season.

Linseed Oil.—Prices are very firm, in sympathy with the high cost of seed, and crushers are very indifferent sellers at current prices, which barely cover the cost of production.

TRADE NOTES.

The title of the Great Western Can & Machine Company of San Francisco, Cal, has been changed to the Great Western Can Company, Incorporated, and the offices of the concern have been removed from 139 First street to 3 California street, San Francisco. Charles Josselyn is general manager.

The Architectural Stamping Works, Grand Rapids, Mich., make an announcement in our advertising columns this week that will be of interest to the trade. They call attention to their Architectural Sheet Metal Work, Ornaments, Statuary, Steel Ceiling, Brick and Rock Face Siding, Metal Spinning, &c. A catalogue giving full information about their line of goods will be furnished on application.

Covert Mfg. Company, West Troy, N. Y., refer to the volume of their business last year as having exceeded that of any in their history, and that as they make it a rule to execute orders if possible within 24 hours of receipt they will run nights to keep pace with the demand from February 1.

The Asbestos Sad Iron Works, at Stoughton, Wis., are reported to be daily turning out 300 sets of Finished Irons, employing over 40 men in their manufacture.

Henry W. Johns, president of the H. W. Johns Mfg. Company, New York City, died on February 8, at his home Park Hill, Yonkers, N. Y., aged 61 years.

A Madrid dispatch states that the cost to Spain of the Cuban war from February, 1895, to the end of 1897 is officially estimated at $240,000,000, besides the arrears due from the Cuban treasury, which amount to $40,000,000.

Peck Bros. & Co.

The business of Peck Bros. & Co., New Haven, Conn., which passed into the hands of a receiver March 14, 1896, will be sold at public auction on the premises, in New Haven, March 2, and, it is thought, will be bid in by the stockholders. During the receivership the business has prospered, and up to January 1, 1898, about one-half the total indebtedness of $600,000 has been paid off, leaving about $300,000 yet to be settled. The 1898 inventory is said to have shown assets of about $630,000. The capital stock being $600,000, and outstanding debts about $300,000, it is estimated that the stock is worth fully 50 cents on the dollar. There is therefore some inducement for the stockholders to pool their interests and raise enough money to buy in the plant, stock, book accounts, good will and name at the sale on March 2.

The British Sheet Iron Industry.

The sheet iron manufacturing industry of Great Britain, which hitherto has had its center in the South Staffordshire, or Midland, region of England, known as the "Black Country," is reported to be gradually shifting its base. It is found that the production of comon sheets for galvanizing purposes, being an almost exclusively export trade, can no longer be made remunerative in a district so far removed from the seaboard as South Staffordshire, and little doubt is felt that in a few years South Wales will become the great center of this industry. The price at which common black sheets are now selling in England is said to involve a loss to the Midland producer of $1.50 to $2.50 a ton, reckoned on the basis of the present cost of fuel, labor and pig iron. The result is that the sheet mills in the Black Country are shutting down in all directions, and only those concerns who make iron and steel sheets of superior quality for special purposes are able to run their plants at a profit. This tendency of the British sheet iron industry to seek the seaboard is materially hailed with satisfaction in South Wales, where it is likely to furnish a welcome field of effort for some of the capital and labor which has been displaced by the decline in the tin plate trade of that region. Llanelly, the erstwhile tin plate capital, is already coming to the fore as a center of sheet iron manufacture, and at other places in the neighborhood sheet mills are being erected or are in contemplation. So it is, as ever, an ill wind that blows no one any good.

The Caracas Warehouse.—It is expected that on or about March 26 the warehouse which the National Association of Manufacturers is establishing at Caracas, Venezuela, will be opened. This warehouse will be for the purpose of exhibiting permanently goods of American manufacture. There will be present at the opening officials of the Venezuelan Government, prominent South American merchants, and several manufacturers from the United States. Rudolph Dolge, the association's special commissioner to Venezuela, is now in Philadelphia at the association headquarters, completing final details. He will leave for Caracas on the steamer "Venezuela," sailing Saturday next. It is the general opinion among the large manufacturers in this country that much good will be accomplished by this warehouse, and about 60 manufacturing concerns of prominence have already secured space. This number will, doubtless, be increased considerably as soon as the house is opened. An American manufacturer who has very successfully invaded the South American field with his goods said to-day: "American manufactures are very much in demand in the Pan-American countries, and the warehouse system will furnish a good opportunity of bringing our goods to them, if properly operated."

We are advised that a company have been formed by P. H. Abernathy, Asheville, N. C., to work some of the mica properties in Mitchell and Yancey counties, N. C. Among the first to be put in operation will be the Sink Hole, Clarissa and Cloud Land mines. The company will have under their control, we are advised, some of the best properties in that section. Their offices and cutting house will be located at Asheville, which will be the distributing point.

The Goheen Mfg. Company, Canton, Ohio, issue a circular giving many testimonial letters referring to the merits of their products. In addition to manufacturing carbonizing coating this firm make a full line of ordinary structural paints, including graphite, iron oxide, carbon, iron ore, asphaltic mixtures and magnetic reds and browns. To any one interested in the subject they will be glad to send their pamphlet giving information on the preservation of iron and steel.

The final step in the water power system at the Falls of Foyers, Scotland, which was undertaken by the British Aluminum Company for the operation of their works, has at length been completed, thus placing the company in a position to greatly enlarge their output of aluminum, for which the English demand is rapidly increasing. By means of the system a continuous 5000 horse-power is produced at the company's factory.

The large plant of the F. A. Walsh Company, manufacturers of packers' tinware and tinning machinery, Milwaukee, Wis., was destroyed by fire on January 22.

The Treasury Department has decided that aluminum exported in the form of sheets, plates, bars or ingots manufactured by the Pittsburgh Reduction Company wholly from imported alumina, reduced by the electrolytic process, is entitled to a drawback equal in amount to the duty paid on the imported material used, less a deduction of 1 per cent.

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Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 10, 1898.

Tin—

Straits pigs.....15⅛@15¾¢

American Tin Plates—

American Base Box Quotations.

Based on 32,000 square inches in a box, which is exactly 2 per cent. more than in the English base box of 14 x 20 Tin Plates. The American base box weighs 110 ℔ and the English base box 108 ℔.

Highest Grade Charcoal—Bright.

Size.	Base.	Contents.	Per box.
10 x 14,	110-℔	...240 sheets	$5.65
"	140-℔	" "	7.25
12 x 12,	110-℔	" "	5.75
"	140-℔	" "	7.50
14 x 20,	110-℔	....120 "	5.65
"	140-℔	" "	7.25
"	160-℔	" "	8.85
"	180-℔	" "	10.45
"	200-℔	" "	13.15

20 x 28 double the price of 14 x 20.

12½x17,	140-℔	....120 sheets	5.35
"	180-℔	" "	6.95

Second Grade Charcoal—Bright.

10 x 14,	110-℔	....240 sheets	5.10
"	140-℔	" "	6.15
12 x 12,	110-℔	" "	5.25
"	140-℔	" "	6.30
14 x 20,	110-℔	....120 "	5.10
"	140-℔	" "	6.15
"	160-℔	" "	7.25

20 x 28 double the price of 14 x 20.

Highest Grade Coke—Bright.

10 x 20,	110-℔	....240 sheets	5.75
12 x 12,	110-℔	" "	4.15
"	140-℔	" "	4.95
14 x 20,	110-℔	....120 "	4.00
"	140-℔	" "	4.85

20 x 28 double the price of 14 x 20.

20x26½,	110-℔	....120 sheets	8.00
20x29½,	110-℔	" "	8.85
20x32½,	110-℔	" "	9.90
"	140-℔	" "	12.35
20x39½,	140-℔	" "	15.00

Old English Method Quotations.

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$5.25
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	6 75
	IXX, 14 x 20	8.25
	IXXX, 14 x 20	9.75
	IXXXX, 14 x 20	11.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.50
Allaway Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	4.75
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$3.75
	IC, 10 x 20	5.50
	IC, 17 x 17	7.75
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.00
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	4.50
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔	15¢
95 ℔	20¢
90 ℔	25¢
85 ℔	30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	10.50@ 12.00
Worcester Grade. 12 to 14 lbs. coating	8.00@ 9.00
S T P —— Grade, L 10 to 12 lbs. coating	7.50@ 8.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00
		Per box of 56 sheets.
IX, 14 x 56	21.00	$12.50
IXX, 14 x 56	24.00	14.00
IX, 14 x 60	23.00	13.50
IXX, 14 x 60	27.00	15.00

Sheet Steel—

Black.

	Common American.	Refined.
Nos. 10 to 16	2.00¢	2.40¢
17 to 20	2 10¢	2.50¢
21 to 24	2.20¢	2.60¢
25 and 26	2.30¢	2.70¢
27	2.40¢	2.80¢

Russia, Planished, &c. 100 ℔.

Patent Planished, ℔, A	$10.20	5%
Patent Planished, ℔, B	9.20	dis.
Craig's Polished Sheet Steel		8½¢
U.S. Polished Sheet Steel No. 27 A		5.05¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....11⅛@ 11⅝¢
Casting Brands.....11⅜@ 11½¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gliding Tube, 3¢ ℔ additional.

Brazed Brass Tubing, (100 ℔ lots). (To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.08
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.	
Small lots	℔, 40¢
100-℔ lots	℔, 36¢
No 2 (guaranteed over 90% pure).	
Small lots	℔, 34¢
100-℔ lots	℔, 33¢
Nickel Aluminum Casting Metal.	
Small lots	℔, 39¢
100-℔ lots	℔, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.	
Small lots	℔, 35¢
100-℔ lots	℔ 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter	℔, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter	℔, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 ℔ or more. Less quantities, 5¢ ℔ additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	℔	℔	℔
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4⅛@4¾¢

Sheet Zinc—

600-℔ casks.....5¾¢
300-℔ casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead.....4¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&10%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection	$2.25 square
Climax	2.20 square
The Lloyd Spanish Tiling	4.50 square
W. J. Burton & Co.'s Roll Cap	3.00 square

Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.35
Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. ℔ square,	$4.75	$4.50
Galv. ℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square

Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20.....8.00 square
Steel Painted, 14 x 20.....7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14.....5.50 square
7 x 10.....6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10.....8 50 square

Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine	8 @ 12
Iron Paint, Bright Red	℔ 2
" " Brown	℔ 1½
" " Purple	℔ 2½
" " Ground in oil, B. Red	℔ 6½
" " Ground in oil, Red	℔ 6½
" " Ground in oil, Brown	℔ 5½
" " Ground in oil, Purple	℔ 6½
Linseed Oil, Boiled, in bbls	44
Linseed Oil, Raw, in bbls	42
Mineral Paints	1 @ 3
Orange Mineral	12
Pure White Lead in Oil	5½ @ 6
Dry White Lead in bbls	5 @ 5½
Red Lead, American	5¼ @ 5¾
Red, Venetian, English, dry	1½ @ 1¾
Red, Venetian, in oil, asst'd cans	8
	kegs 3 to 6
Sipe's Japan Oil, in bbls.	℔ gal. .34
Spirits Turpentine, in bbls.	℔ gal. .37
Asphaltum, Trinidad Refined	℔ ton. $4
Tarred Felt, 1 Ply	℔ 100 ℔ $1.2
Tarred Felt, 2 Ply	℔ roll 108 sq. feet 90
Tarred Felt, 3 Ply	℔ roll 108 sq. feet $1.2
Roofing Pitch	℔ bbl of 300 ℔ $3.0

NEW YORK, FEBRUARY 11.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₩ lb, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than	6-in.	14-in.	24-in.
And including	14-in	24-in.	30-in.
	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.42	.45
" 21 to 23	.42	.44	.47
" 24	.42	.46	.49
" 25	.43	.47	.50
" 26	.43	.50	.55
" 27	.44	.53	.58
" 28	.44	.53	.60
" 29	.45	.56	.65
" 30	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 8¾¢
Hallett's.....₩ lb, 7½¢
Japanese.....₩ lb, 7¼¢

Brass—Planished.....net

Roll and Sheet .....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.	
⅛-in. up to 2-in.	$0.35	35% off.
5/32-in. up to ¾-in.	.36	
⅛-in. up to 5/8-in.	.38	
5/32-in. up to ½ in.	.41	
3/16-in. up to 3/8-in.	.48	
5-16-in. up to ¾-in.	.65	
¼-in. up to 5-16-in.	1.00	
3-10-in. up to ¼-in.	1.50	
⅛-in. up to 3-16-in.	Special	
Smaller than ⅛-in.	Special	
3-in. and larger	.38	
2-in. to 3-in., to No. 19, inclusive		

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—
Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ lb 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ansonia Grade Casting.....11¼¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2 00	2.30¢
Nos. 17 to 21	₩ lb, 2.10	2.40¢
Nos. 22 to 24	₩ lb, 2.20	2.50¢
Nos. 25 aud 26	₩ lb, 2.30	2.60¢
No. 27	₩ lb, 2.40	2.70¢
No. 28	₩ lb, 2.50	2 80¢
American B. B.	₩ lb, 4¢	

Russia, Planished, &c.
Genuine Russia, according to assortment.....₩ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ lb, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

Nos. 10 to 16	₩ lb, 12¢	75&10& 5% off.
Nos. 17 to 21	₩ lb, 13¢	
Nos. 22 to 24	₩ lb, 14¢	
Nos. 25 to 26	₩ lb, 15¢	
No. 27	₩ lb, 16¢	
No. 28	₩ lb, 17¢	
No. 29	₩ lb, 19¢	
No. 30	₩ lb, 21¢	

36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....38¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's. 100@500 lb..... 6 ¢
Lead. Amn. White, in oil..... 6 ¢
Lead, Red. bbls. and ⅛ bbls..... 6 ¢
Lead, Red, kegs..... 6 ¢
Ochre, American..... 1½¢
Red Venetian, American..... 1¾¢
Linseed Oil:
Raw, ₩ gal.....45@46¢
Boiled.....47@48¢
Spirits Turpentine:
In bbls.....36¢
In cases.....44¢
Putty:
In barrels and ½ bbls..... 1¾@2¢
In tubs.....1¾@2¢
In tin cans..... 2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5 ¢
Clarified.....₩ lb 4⅞¢
Accra.....₩ lb 4¾¢
Half Jack.....₩ lb 4½¢
Cecilia.....₩ 100 lb $4.85
Choice Red.....₩ 100 lb 4.60
(*Spot Oil, ⅛c. ₩ lb higher.*)

Petroleum Products—

In Barrels (Barrel Included).
Stove Gasoline..... ₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.
Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897..... 40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons..... 75%
Galvanized Iron Range Boilers above 52 gallon.....65%
N. B.—5 % extra on Standard 30, 35 and 40 gal. Boilers.
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....50%
" " " Backs Plain.....60%
" " " " Galvanized....50%
" " " Legs Plain.....60%
" " " " Galvanized....50%
" " " Backs with air chambers, Plain.....50%
Cast Iron Sinks, Backs with air chambers Galvanized 50%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.
Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.	₩ bbl.	$1.47@$1.48
Rosin, E. & F.	₩ bbl.	1.52@ 1.60
Rosin, G. & H.	₩ bbl.	1.65@ 1.70
Rosin, I. & K.	₩ bbl.	1.80@ 1.90
Rosin, M. & N.	₩ bbl.	2.10@ 2.45

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₩ sqr.		$3.50@$4.50
No. 1 Bangor Ribbon		3.00@ 3.25
Pen Argyle, ₩ sqr		3.25@ 3.50
Peach Bottom, ₩ sqr		4.75@ 5.60
No. 1 Chapman, ₩ sqr		3.00@ 4.25
Lehigh Slates, ₩ sqr		3.25@ 3.80

Vermont:

Sea Green, ₩ sqr		$2.45@$3.05
Purple, ₩ sqr		3.75@ 4.00
Variegated Purple		2.25@ 2.90
Unfading Green, ₩ sqr		3.50@ 4.00
Red, ₩ sqr		8.50@10.50

Solder and Soldering Fluids—

Solder—

½&½ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f o.b. New York.
In barrels. ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb..... .....4¢
5 % dis.

Yager's Soldering Salts.
½ lb bottles, each.....30¢
Large quantities, ₩ lb.....40¢

Soldering Coppers—

Per lb.....15¢@16¢ net

Spelter—

Western Spelter..... 4½¢
Bertha (pure)..... ...7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized..... .....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15½¢
Straits, pigs, lb lb.....14½@15¢
Straits, in bars, ₩ lb..... .....15½@16¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20	5.75
" "	IXXX,	14 x 20	6.50
" "	IXXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:
100 lb.....10¢
95 lb.....15¢
90 lb.....20¢
85 lb.....25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating.....	8.00 @ 9.25
STP Grade, 10 to 12 lb coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20	$5.00
" "	IX,	14 x 20	6.00
Allaway Grade,	IC,	14 x 20	4.25
" "	IX,	14 x 20	5.00

Coke Plates, Bright—

Steel Coke,	IC,	14 x 20 ..... $4.25
	IX,	14 x 20 ..... 5.25

Terne Plates—

Worcester Grade,	IC,	14 x 20..... 4.25
		20 x 28..... 8.50
Dean Grade,	IC,	14 x 20..... 4.00
		20 x 28..... 8.00
Gilbertson's Old Method.	IC,	14 x 20.. 7.50
		20 x 28.. 15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 189 .

1¼ and less, Plain	57&10%
1¼ and less, Galv.	50&10%
1½ and larger, Plain.....	67&10%
1½ and larger, Galv.....	55&10%
Screw and Socket Joint Casing.....	65%
Inserted Joint Casing.....	60%
Boiler Tubes, 2¼ inch and smaller.	72½%
2½ inch and larger	75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Acid Swabs.
Sherman, J. S.. Cassopolis, Mich.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Wheeler, Russel & Son. Utica. N. Y.

Aluminum.
Hill-Whitney Aluminum Co., Boston, Mass.
Reymond & Gottlob, 26 Cortlandt St. N. Y.

Aluminum Ware.
Illinois Pure Aluminum Co., Lemont, Ill.

Architectural Ornaments.
Frand, Martin J. & Co., Camden, N. J
Friedley & Voshardt, Chicago, Ill.
Ornamental Stamping Works, Grand Rapids, Mich.
Willis Mfg. Co., Galesburg, Ill.

Ash Sifters.
Campayna, Eugene W., Randolph, Mass.

Baskets, Metallic.
Kieckhefer Bros. Co., Milwaukee, Wis.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M. Mfg. Co., Rome, N. Y.

Beer Pumps.
I. X. L, Beer Pump Co., Phila., Pa.

Bronze and Bronzing Liquid.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Northrop, H. S., 40 Cherry St., N. Y.
Ornamental Stamping Works, Grand Rapids, Mich.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Cocks, Ball, Basin and Stop.
Landers, Frary & Clark, New Britain, Conn.
Peck, Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros. Co., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cork Pullers.
Arcade Mfg. Co., Freeport, Ill.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, Ohio.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Berger Bros. Co., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.
Oster Mfg. Co., Cleveland, Ohio.

Dinner Pails.
Kieckhefer Bros. Co., Milwaukee, Wis.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dumb Waiters.
Energy Mfg. Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Hangers.
Berger Mfg. Co., Canton, O.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co, Windsor, Conn.
Hanson & VanWinkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

Electric Light and Power Apparatus.
Eddy Electric Mfg. Co., Windsor, Coun.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

Enameled Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Expansion Tanks.
Koven, L. O. & Bro., 18 Spruce St., N. Y.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Carton Furnace Co., Utica, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water St., N. Y.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Ct.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Tubular Heating & Ventilating Co., Phila., Pa.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Shepard, Sidney & Co., Buffalo, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.
Wilson, F. Cortez & Co., Chicago, Ill.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Gutter Formers.
Whelan, Dennis. J., Troy, N. Y.

Hammocks.
Palmer, I. E., Middletown, Ct.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Amer. Boiler Co., Chicago, Ill.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Magee Furnace Co., Boston, Mass.
Mitchell Heater Co., Poughkeepsie, N. Y.
Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., Fce Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Richmond Stove Co., Norwich, Conn.
Smith Co., H. B., 135 Centre St., N. Y.
Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

Hollow Ware.
Griswold Mfg. Co., Erie, Pa.
Kieckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

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Illinois Pure Aluminum Co., Lemont, Ill.

House Furnishing Supplies.
Dover Stamping Co., Boston, Mass.
Parks & Parks, Troy, N. Y.

Iron, Galvanized Sheet. (*See Sheets, Galvanized.*)

Iron, Kalameined.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Kitchen Specialties,
Dover Stamping Co., Boston, Mass.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Schratwiesers Metal Lath Works.

Lavatories.
Wheeler, E. S. & Co., New Haven, Ct.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Munsell, Eugene & Co., 218 Water St., New York.

Milk Cans.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
Shepard, Sidney & Co., Buffalo, N. Y.

Nickel Plating Outfits.
Eddy Electric Mfg Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Patterns.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pipe Fitter and Crimper.
Blumer, Doscher Mfg. Co., Brooklyn, N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Pipe, Water and Gas.
Millar, C. & Son, Utica, N. Y.

Plumbers' Tools, Specialties and Supplies.
Barstow Stove Co., Providence, R. I.
Colwell Lead Co., 63 Centre St., N. Y.
Crawford & Young, Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Landers, Frary & Clark, New Britain, Conn.
National Pipe Bending Co., New Haven, Conn.
Oster Mfg. Co., Cleveland, Ohio.
Peck Bros. & Co., New Haven, Conn.
Porsch, John, Erie, Pa.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wheeler, E. S. & Co., New Haven, Ct.
Wilson, R. M. Mfg. Co., Rome, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Adriance Mach. Works, Brooklyn, N. Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.
West Mfg. Co., Buffalo, N. Y.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam and Hot Water.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.

Range Boilers.
Koven, L. O. & Bro., 18 Spruce St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Baldwin Refrigerator Co., Burlington, Vt.
Bowen Mfg. Co., Fond du Lac, Wis.
Challenge Corn Planter Co., Grand Haven, Mich.
Cooper & McKee, Brooklyn, N. Y.
Gurney Refrigerator Co., Fond du Lac, Wis.
Northern Refrigerator Co., Grand Rapids, Mich.

Registers.
Excelsior Steel Furnace Co., Chicago, Ill.
Highton, Wm. & Sons, Boston, Mass.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Burton, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Ornamental Stamping Works, Grand Rapids, Mich.
Phila. Steel Roofing Co., Phila., Pa.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines,
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Seamers.
Burritt, O. W. & Bro., Weedsport, N. Y.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Bray, J. & Co., E., Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Adriance Mach. Works, Brooklyn, N. Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. C. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Poorman Mfg. Co., Piqua, Ohio.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co. Brooklyn, N. Y.
Toledo Mach. & Tool Co., Toledo, O.
West Mfg. Co., Buffalo, N. Y.
Whelan, Dennis J., Troy, N. Y.

Sheet Metal Work.

Willis Mfg. Co., Galesburg, Ill.

Sheets, Iron and Steel.

Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Sheets, Galvanized.

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.

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Halliday, M., East 9th St., N. Y.

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Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.

Burgess Solderiug Furnace Co., Columbus, Ohio.

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Kicley, T., 7-11 West 13th St., N. Y.

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Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.

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Cope, G. W., Detroit, Mich.
Gobellie Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

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Marlin & Co., Pittsburgh, Pa.

Stove Pipe Collars.

Paxton Hdw. Co., Paxton, Ill.

Stove Pipe Thimbles.

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Stove Polishing Mitten.

Parks & Parks, Troy, N. Y.

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Troy Nickel Works, Troy, N. Y.

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Brand Stove Co., Milwaukee, Wis.
Graff & Co., 208 Water St., N. Y.
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Portsmouth Stove & Range Co, Portsmouth, O.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Sheppard, Isaac A. & Co., Phila., Pa.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.
White-Warner Co., Tauuton, Mass.

Stoves and Ranges, Gas.

Griswold Mfg. Co., Erie, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.

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Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

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Berger Bros. Co., Phila., Pa
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Bliss, E. W. Co., Brooklyn, N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co, 27 Murray St., New York.
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Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.

Vogel, Wm. & Bros. Brooklyn, N. Y.

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Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Berger, L. D, Philadelphia, Pa.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Ellwood Tin Plate Co., Ellwood City, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

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Keen & Hagerty Mfg. Co., Baltimore, Md.
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Saunders', D. Sons, Yonkers, N. Y.

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Eastwood Wire Mfg. Co., Belleville, N. J.
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Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
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Washburne, E. G. & Co., 46 Cortlandt St., New York.

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Keen & Hagerty Mfg. Co., Baltimore, Md.

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Peck Bros. & Co., New Haven, Conn.

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Kemp, C. M. Mfg. Co., Baltimore, Md.

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Miner & Peck Mfg. Co., New Haven, Ct.

Wiping Cloths.

Porsch, John, Erie, Pa.

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THE METAL WORKER.

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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

We require the services of a first-class CORNICE WORKER, who will assist our foreman in the laying out of work; must be an expert workman in the use of the Robinson cornice brake; a steady workman can have a permanent position; give reference and state salary desired. Springfield Cornice Works, Springfield, Mass. Feb. 12

A CORNICEMAN who can cut, make and put up; must be quick and willing and able to do all kinds of job work in shop in a first-class manner; also roofing; want a sober, industrious, married man. Geo. A. Brush, Austin, Texas. Feb. 12

TRAVELING SALESMEN.—Young men of good education, of good appearance and thorough acquaintance with all kiuds of stoves and ranges are wanted by one of the largest houses. Address, with photograph, giving age, experience and salary expected, "Apex," office of *The Metal Worker* 232-238 William street, New York City. Feb. 12

In retail hardware store at Chicago, an experienced CLERK who can also keep books; must speak German; steady position for a hustler. "German," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 12

SALESMAN who calls on stove trade to carry side line of artificial and natural gas hot plates through West Virginia, Kentucky and Maryland. 1216-1218 Peach street, Erie Pa. Feb. 12

Three STOVE PATTERN MAKERS; must be first-class mechanics, active, reliable and competent; state age and also wages wanted. F. S. Weller, Pattern Works, Quincy, Ill. Feb. 12

TRAVELING SALESMEN to handle iron beds as side line in their territory. New Kensingtou Mfg. Company, New Kensington, Pa. Feb. 12

A first class TINNER; capable of making all kinds of tinware, doing roofing and spouting, laying out work and managing men; must be sober, honest and a hustler; steady work. Raymond Barnes, Mount Airy, Md. Feb. 12

Two TRAVELING SALESMEN to sell a newly patented article to breweries, saloons and plumbing shops; must have experience and good references; salary and commission at first; salesmen everywhere. H. Bentelspacher, corner Gold and Water streets, Bridgeport, Conn. Feb. 12

A competent PATTERN CUTTER and worker in galvanized iron and tin shop; one used to working at various things as they may come in; a steady man and a steady job inside; answer stating wages wanted. "A. B.," No. 212, office of *The Metal Worker*, 232-238 William street, New York City. Feb. 12

Large English steel hollow ware firm in Midland counties require experienced FOREMAN to take entire charge of white and white and blue and white enameling department; must be thoroughly competent in all branches and able to control hands. Apply in first case to 206-46 *Ironmonger* office, 42 Cannon street, London Feb. 5

An experienced TINNER, PLUMBER and GENERAL JOBBER; state wages. John H. Newbury, Bay Shore, L. I., N. Y. Feb. 5

A good TIN ROOFER who can do furnace work, general tinsmithing and take charge of shop; must be a good mechanic and hustler; a good job for the right man. "Tin Roofer," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

TRAVELING SALESMAN to sell full line of steel roofing, eave trough, conductor pipe and several specialties; must have some experience and good references. Henry Smith, 22-24 Pickering Building, Cincinnati, Ohio Feb. 5

EXPERT PLATER who understands nickel, copper, brass and special electroplating in antique finishes, &c.; state age, experience, &c. "Metal," care E. S. Adams, 312 The Cuyahoga, Cleveland, Ohio. Feb. 5

First-class STOVE PATTERN FITTER; state experience, age, &c. "Metal," care E. S. Adams, 312 The Cuyahoga, Cleveland, Ohio. Feb. 5

A FOREMAN and CUTTER for cornice and jobbing shop; must be up on all requirements; a good situation to the right man. M. M. Whyte & Bro., 304 Thirteenth street, N. W., Washington, D. C. Feb. 5

A young man who understands something about the cornice business to drum up work part of the time; a good position can be developed by the right man. "F. J. T.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

A first-class TIN and HEAVY SHEET IRON WORKER who understands plumbing, steam fitting and hot water heating, and who can make estimates on that kind of work; a good place at good wages for a man who is a hustler and has ability; must be sober and reliable, and ready to come at once. Lock Box 174, Everett, Wash. Feb. 5

SALESMEN everywhere to sell on commission a newly patented artiele used by roofers. W. R. Pratt, Shenandoah, Pa. Feb. 5

An experienced RETINNER; state quantity of tin used on staple lines and wages wanted. "Retinner," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 5

One good all around SHEET METAL WORKER; a man who can do blower pipe work and outside cornice work; must be married and sober; good shop, good work, good wages, steady job. 68 West Main street, Lexington, Ky. Feb. 5

SITUATIONS WANTED.

SALESMAN who has extensive acquaintance among architects and builders in New York is open for position; experienced in gas range and steam and hot water heating lines; A1 references; open for anything. "A. B. S.," care Davton & Montgomery, 71 Flatbush avenue, Brooklyn, N. Y. Feb. 12

A permanent position by a first-class TINSMITH and MECHANIC; eight years' experience on furnace and all kinds of job work; thoroughly familiar with the hardware trade; strictly temperate; married; references. F. C. Lilley, 75 West Ninety-fifth street, New York City. Feb. 12

By a practical TINSMITH at inside and outside work; wages moderate; steady position; city or country. Charles Stark Box 110, Haledon, N. J. Feb. 12

As TINNERS' HELPER or GENERAL MAN; understands roofing, spouting and ordinary tinning; sober and reliable; state wages. H. Bower, Rawson, Ohio. Feb. 12

By a young man, 29 years of age, who is a good general hand at plumbing, iron pipe work, gas fitting, tinning, stove and furnace work; wages $2 per day; sober and honest. Joseph Smith, 66 Cliff street, New York City. Feb. 12

By a good all around TINSMITH; used to heater work, roofing, piping and general jobbing; some knowledge of plumbing; wages moderate for a steady job; single; 30 years' experience. G Hitchcock, 209 Main street, Poughkeepsie, N. Y. Feb. 12

As JANITOR in New York City, by a reliable man 40 years of age; understands heaters and boilers; ten years' experience as engineer; single; would make himself generally useful; reference G. Dutcher, 11 Laurel street, Poughkeepsie, N. Y. Feb. 12

By a young PLUMBER 23 years of age; quick and neat at lead work; practical at steam and hot water heating; also do tin roofing; eight years' experience; sober and reliable. Wm. McAndrew, Rosendale, N. Y. Feb. 12

By a thoroughly practical TINSMITH on tin roofing, tin and sheet iron work of all kinds, heater and range work, can figure from plans and specifications and make drawings and cut patterns, a position to take charge of a shop or with a stove and furnace house. A. J. Wylie, Trenton, N. J. Feb. 12

By TINNER and FURNACEMAN; capable, sober and reliable. "Tinner," Box 246, Mattoon, Ill. Feb. 12

Young single man, 24 years of age, with 18 months' experience at inside and outside work, desires to finish tinners' trade; wages not so much desired as a good man to work with; would work at books evenings; strictly temperate; best references given. P. O. Box 266, Whitesboro, N. Y. Feb 12

By a PLUMBER; 20 years' practical experience in city and country; strictly first class; neat worker in all branches; can furnish testimonials as to honesty, sobriety and ability; steady work if possible; wages moderate. J. Archer, care W. Linston, 348 Lenox avenue, New York City. Feb. 12

Steady position by a TINSMITH who is a good workman at furnace, stove, range, bench work and roofing; 20 years' experience; sober and industrious; German. Geo. Beinkampen, 443 Main street, Paterson, N. J. Feb. 12

By a man who has had 20 years' experience at tin, sheet iron, country plumbing and hot air heating; a man who can be depended upon and will give satisfaction to employer and customer; position desired on or beforc April 1. "Satisfaction," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 12

By a first-class PLUMBER and GAS FITTER; five years' experience; moderate wages. Chas. E. Edwards, Rockville Centre, N. Y. Feb. 12

Steady position by a first-class TINNER; seven years' experience at inside and outside work E. V. Lorton, 436 West Fifth street, Plainfield, N. J. Feb. 12

TRAVELING SALESMAN wants good side line on commission for hardware, stove or plumbing trade; references. "T. T.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 12

As TINSMITH, by a young married man who is first class at roofing, guttering, leader work and general jobbing; eight years' experience at outside work; will work reasonable for a chance to learn furnace work; will move to any part of the country. "M. R. G.," 857 Cross street, Elizabeth, N. J. Feb. 12

By a SALESMAN, to travel in Central Europe; can speak four languages; would prefer a line of stoves and furnaces. C. Becker, Correspondence Department Y. M. C. A., Cleveland, Ohio. Feb. 12

By a first-class PLUMBER and GAS FITTER; good on tin and sheet iron work; steady and honest. John Abrams, Box 75, Hempstead, N. Y. Feb. 12

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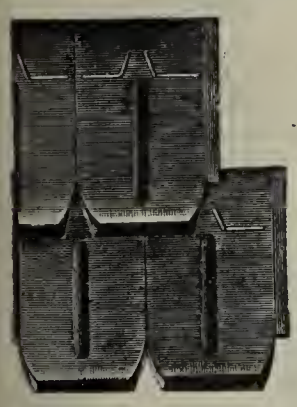
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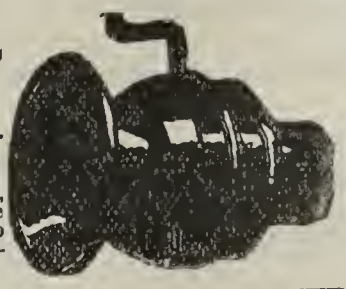


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If a feller's mother didn't tell him he mustn't do so many things he wouldn't want to.

I don't like to fight girls. They scratch, an' any way, when you do lick 'em, they always make you feel so bad about it afterwards. They hain't got any sand, 'cept one; she didn't scratch and she walloped me good. Gee! but she's a dandy.

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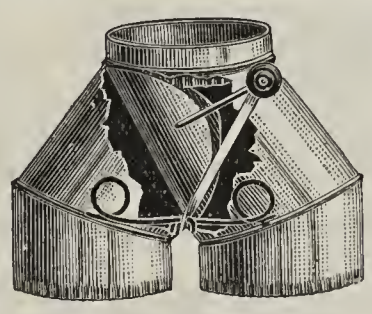
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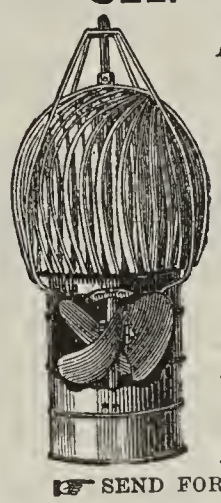
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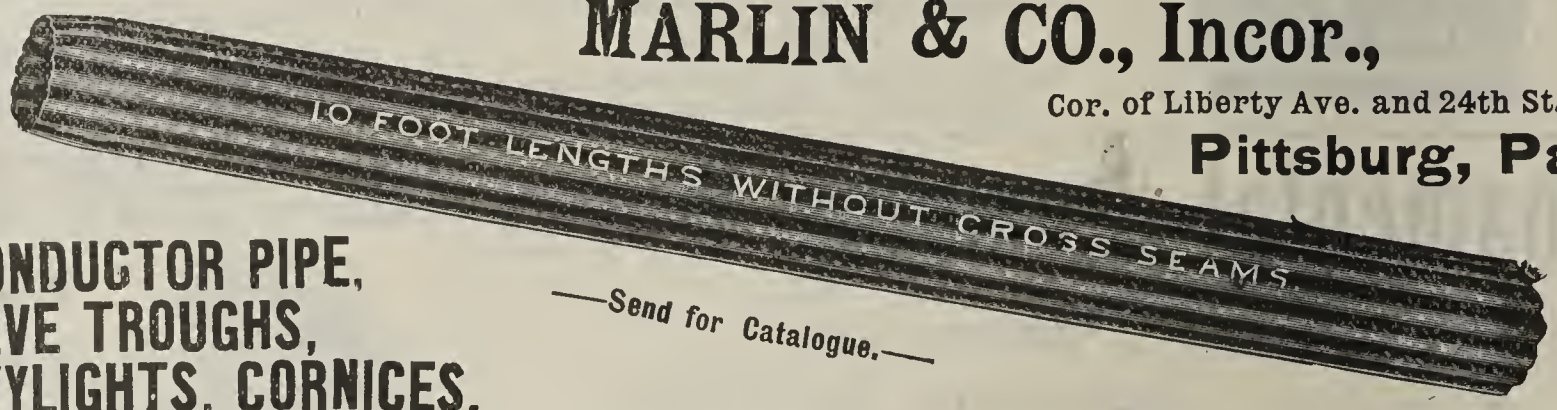
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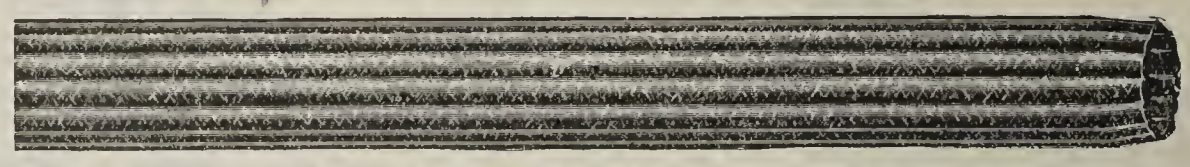
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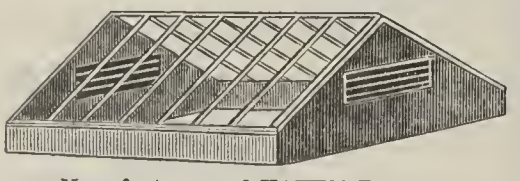
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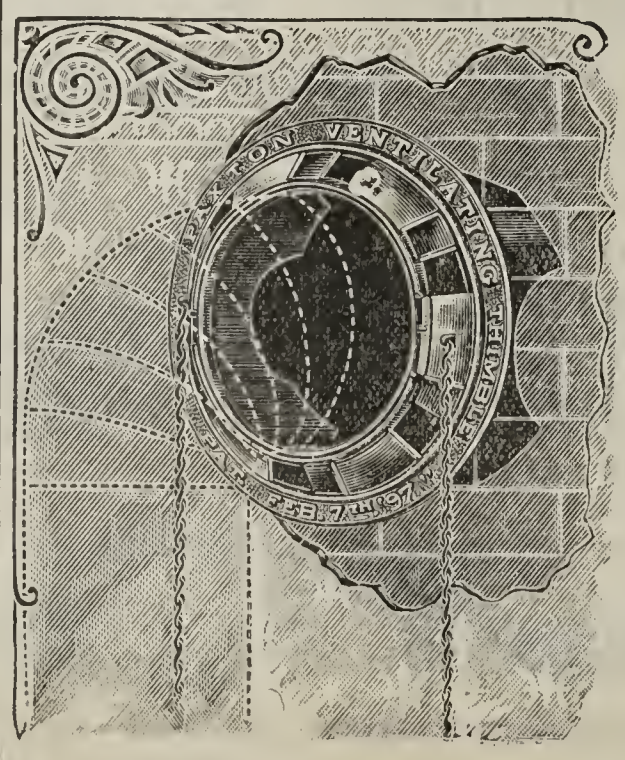
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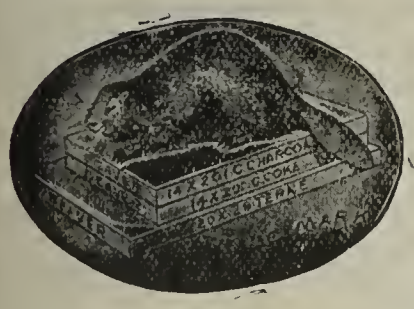
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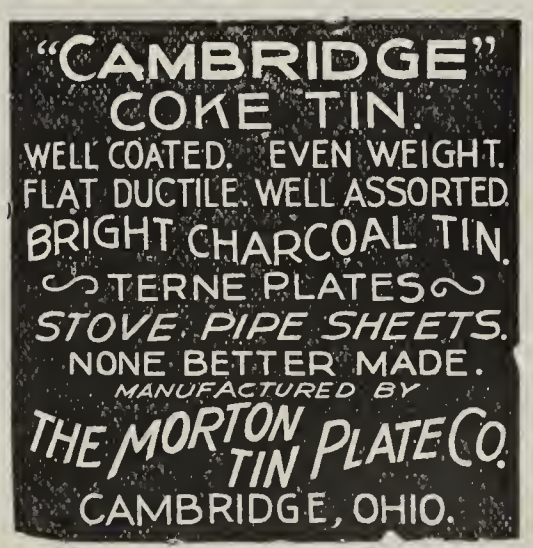
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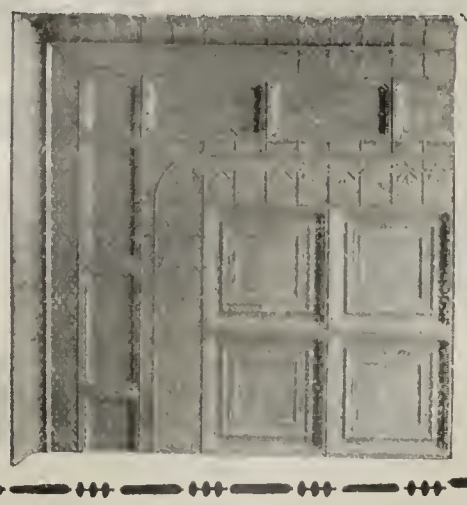
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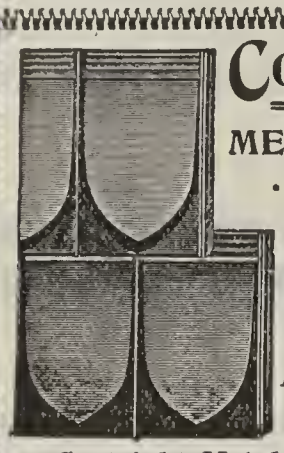
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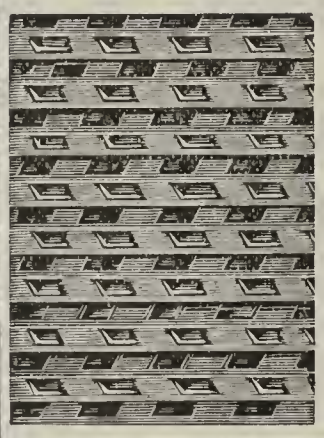
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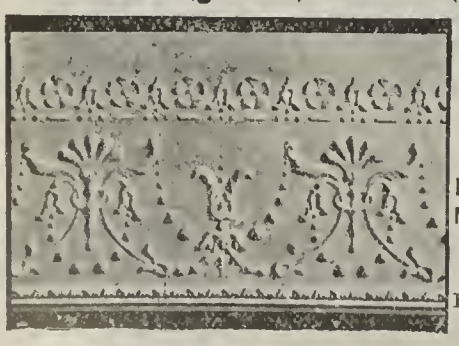
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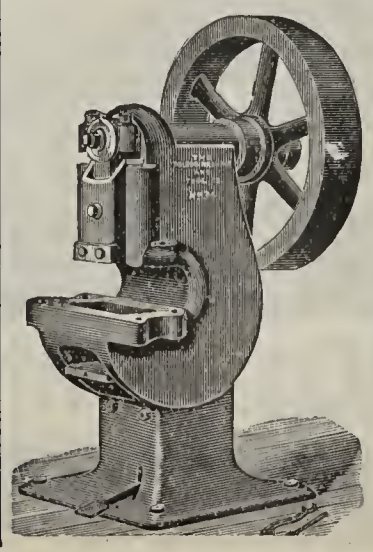
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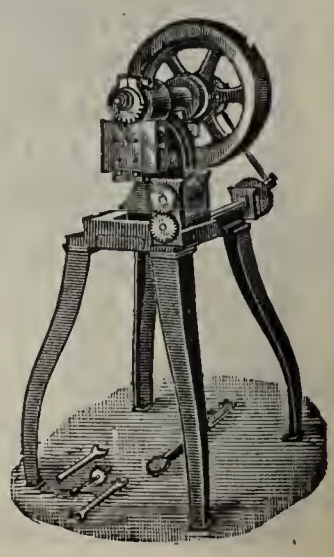
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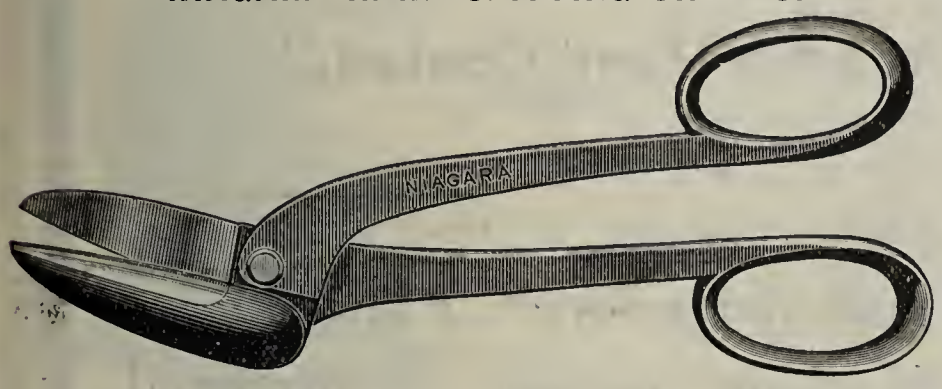


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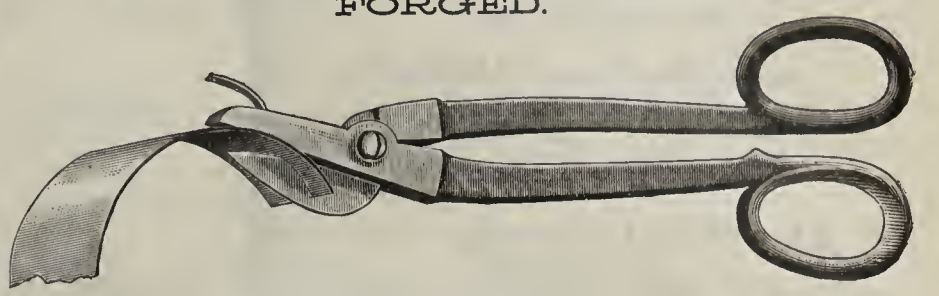


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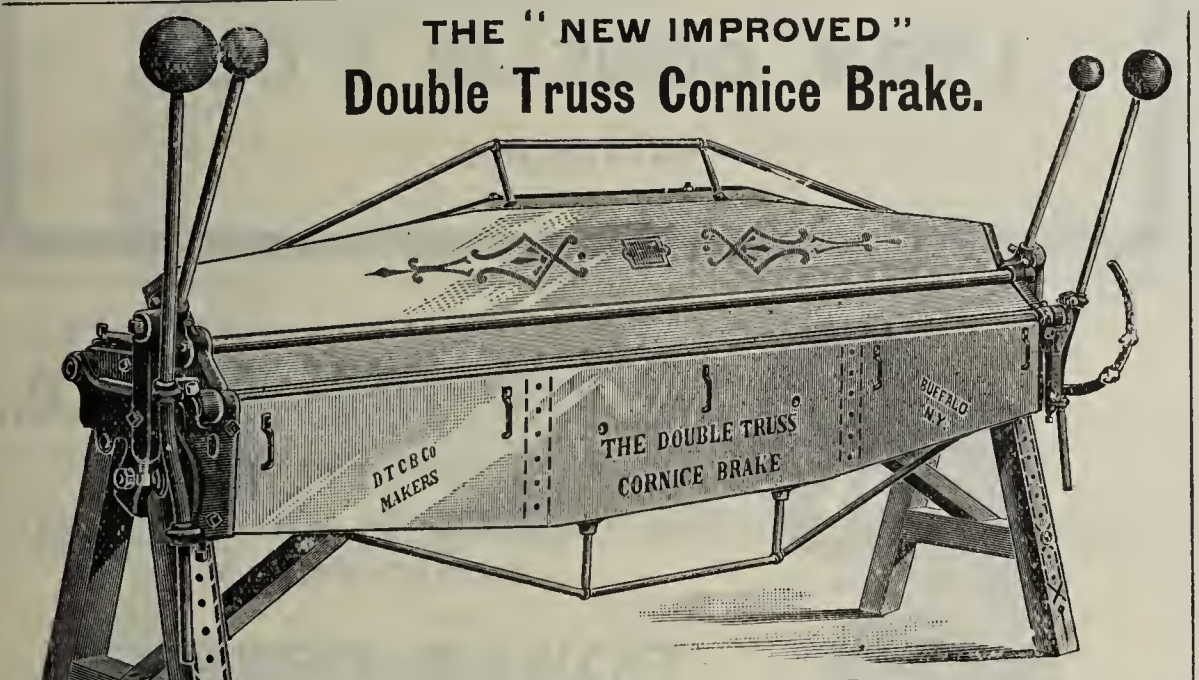


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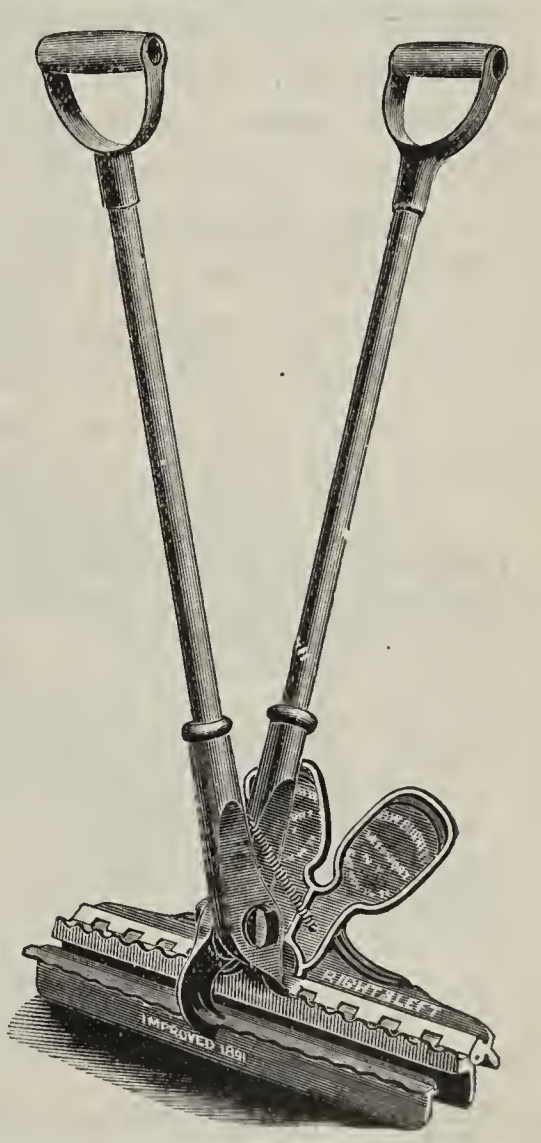
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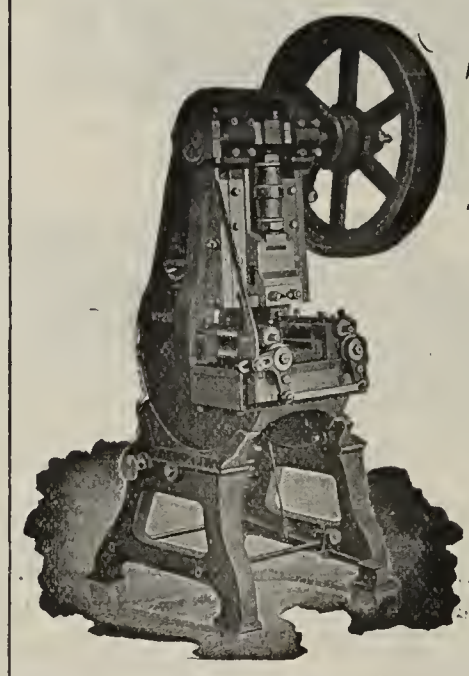
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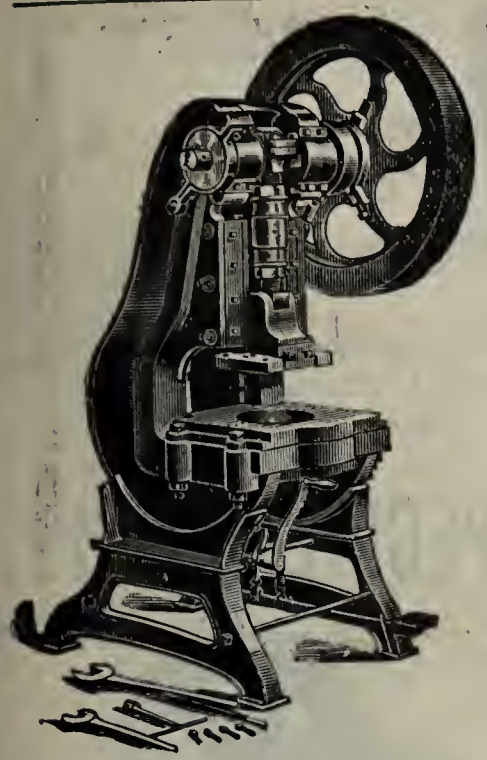
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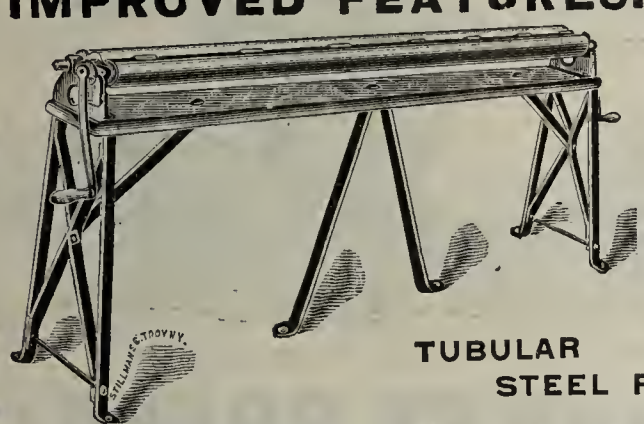
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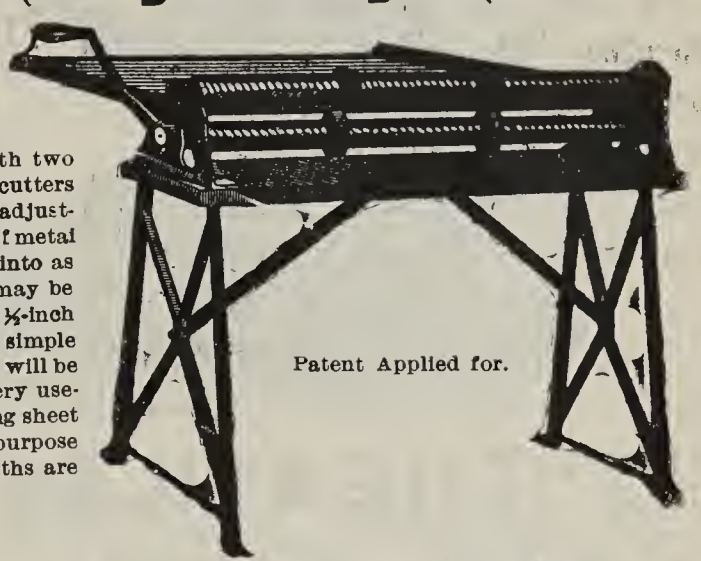
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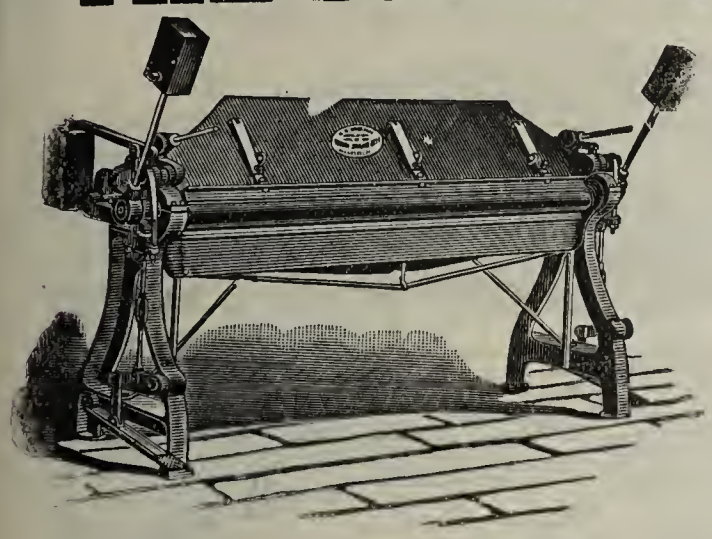
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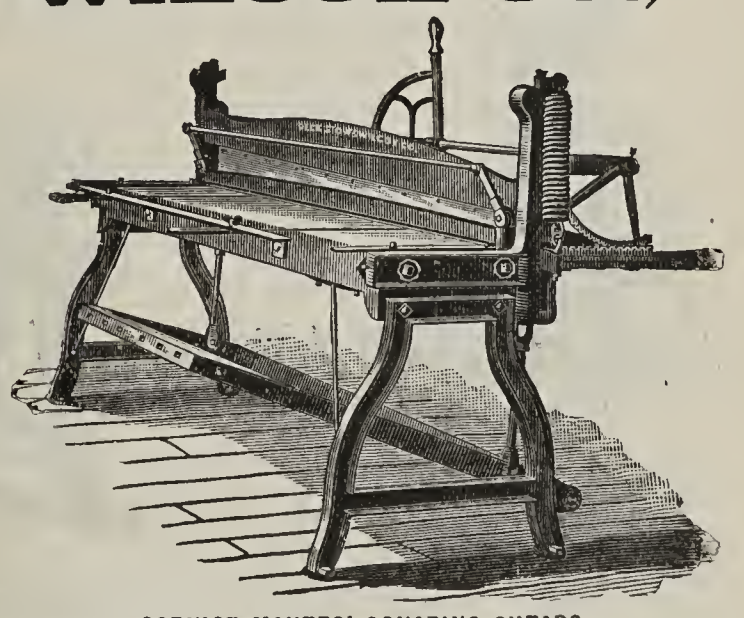
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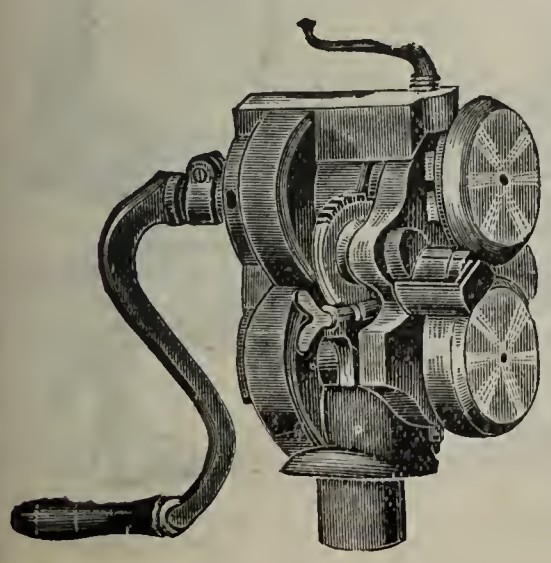
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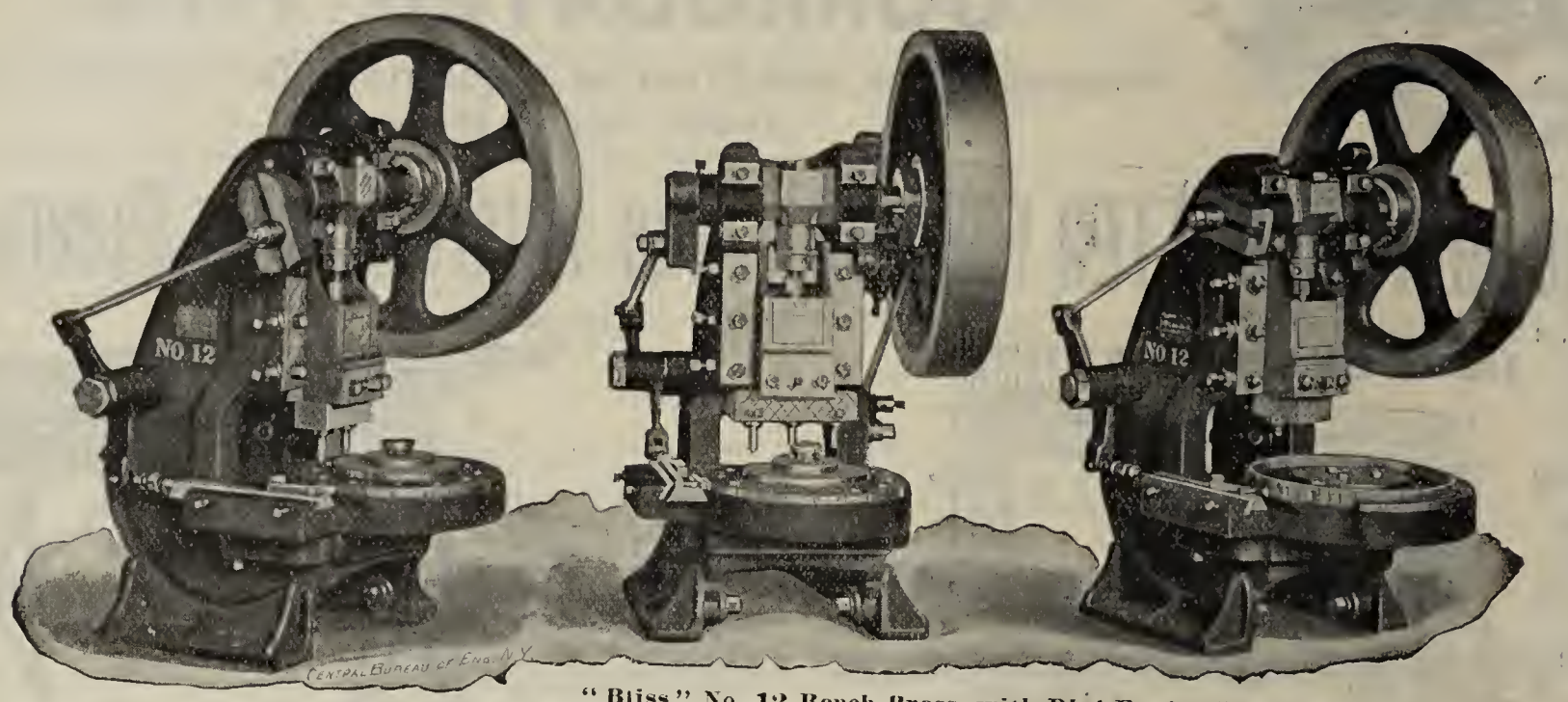
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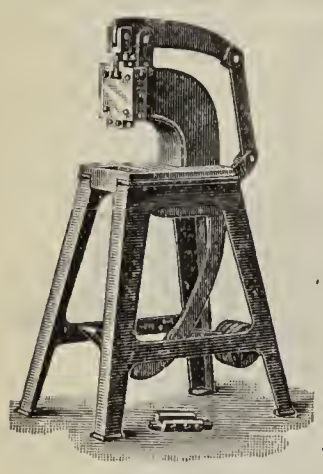
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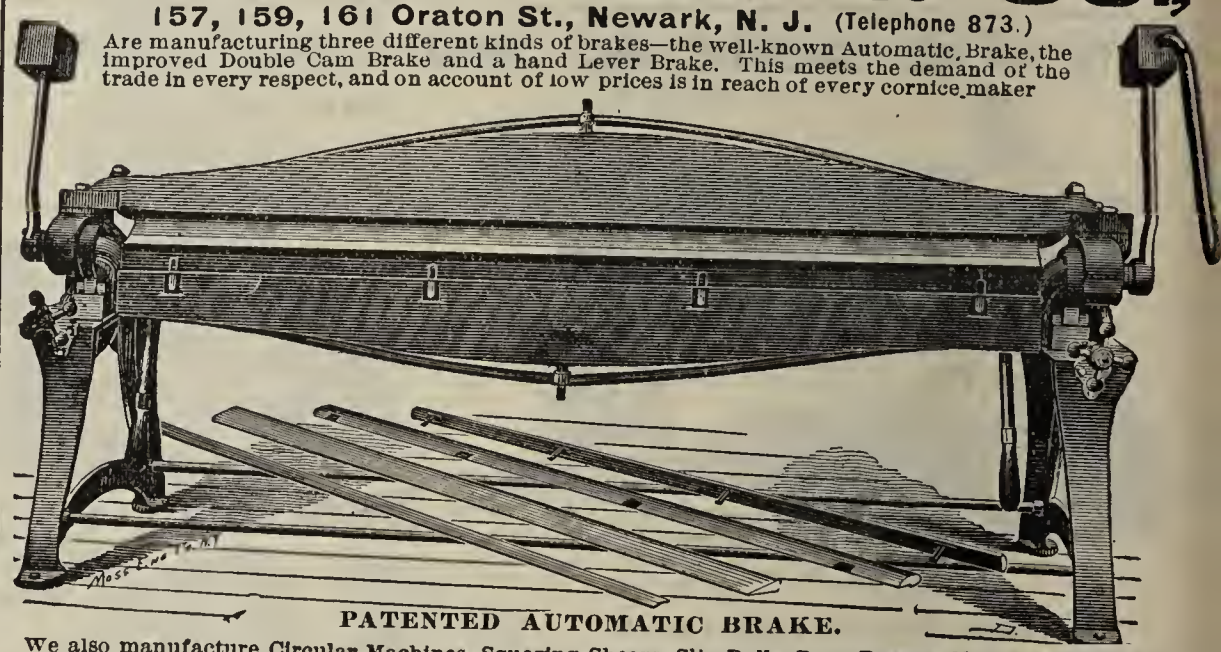


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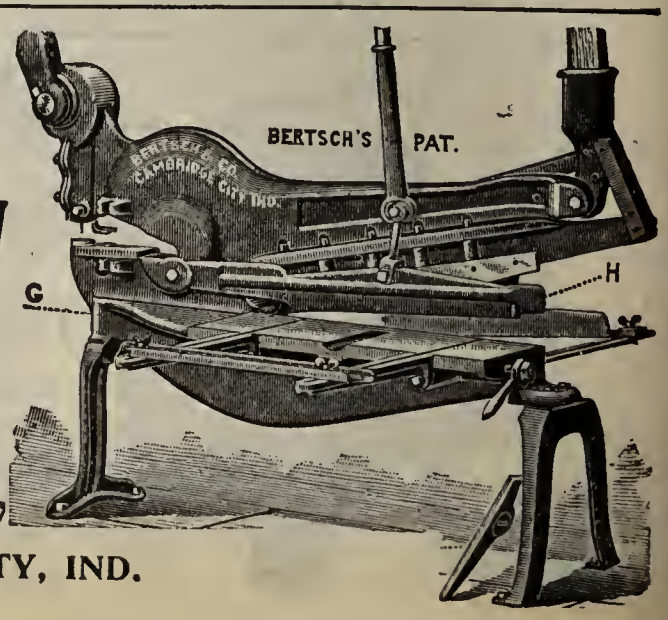
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OF EVERY DESCRIPTION

Manufactured by
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—WHAT THE BOY SAW.—The bright boy's mother is cultivating his bump of observation. "Now, Johnny," holding up a picture card, "shut your eyes and tell me what you saw on this card." "A cow, a barn, a horse," rattled off the bright boy, glibly. "What else?" "Nothin'." "Oh, yes; think now, what did you see behind the cow?" referring to the trees in the background. A moment's reflection. "Her tail," shouted Johnny, ecstatically.—*Chautauqua Assembly Herald.*

—STRATEGIC MOVEMENTS.—First Boy—See here! didn't I see you running down street yesterday with Bill Bounce after you, wantin' to lick you?

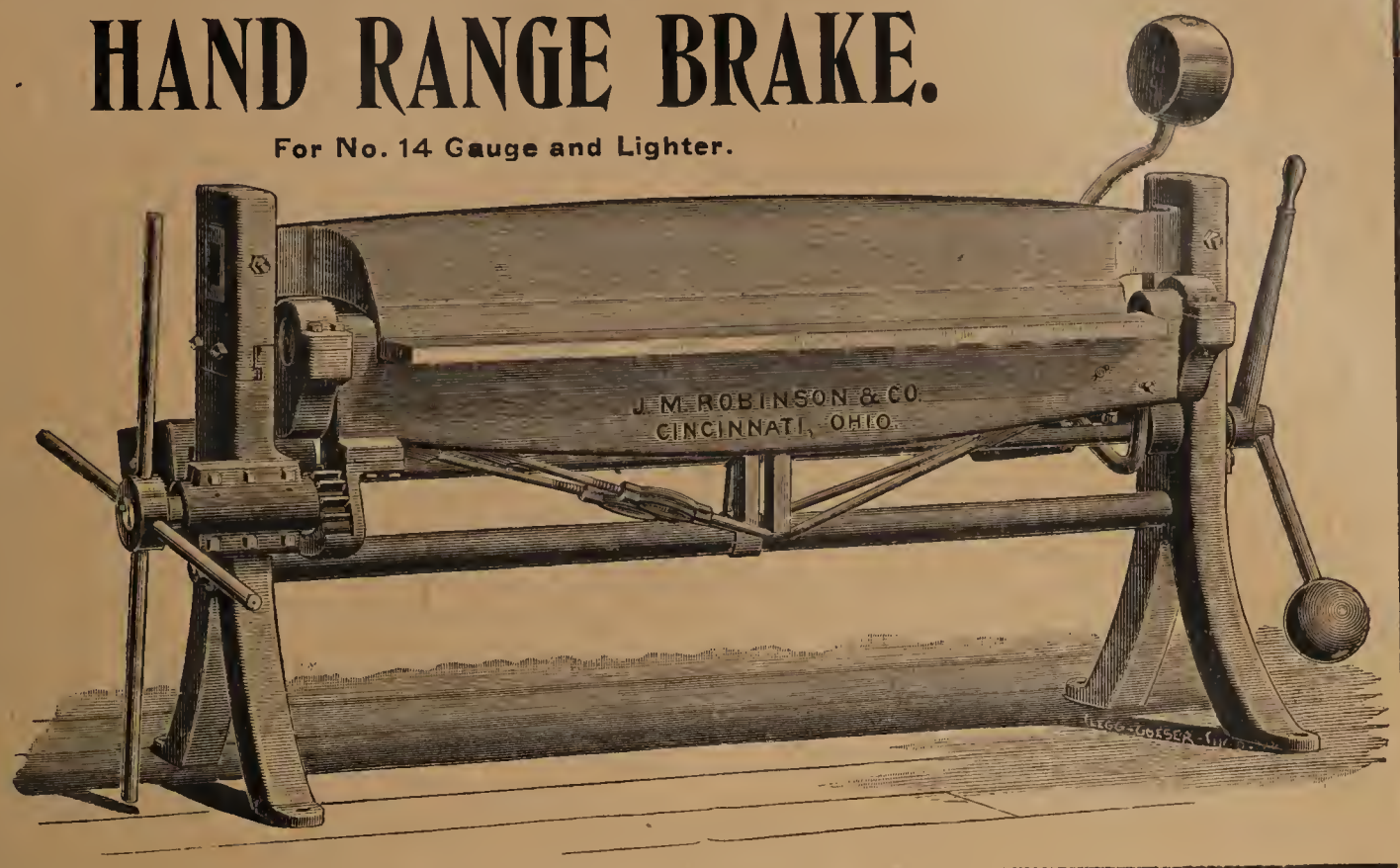
Second Boy—Y-e-s.

"What did you run for?"

"I—I was only running so as to get him away from home, so his mother couldn't see him fightin'; but by the time he was out of sight of his house we got in sight of our house; and then, as my mother would see me if I stopped to hit him I went in, so as to be out o' temptation!"—*New York Weekly.*

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Possesses all the features of the power brake made from the same patterns. Bending bar is operated with a pilot wheel, and imparts great power to the bending bar through the medium of spur gearing meshing into segment attached to the bending bar. Send for complete catalogue and discounts.

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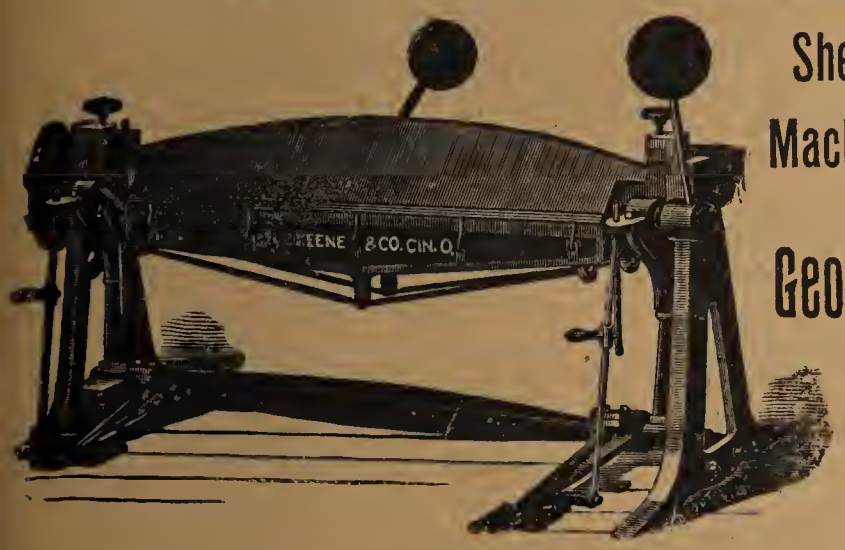
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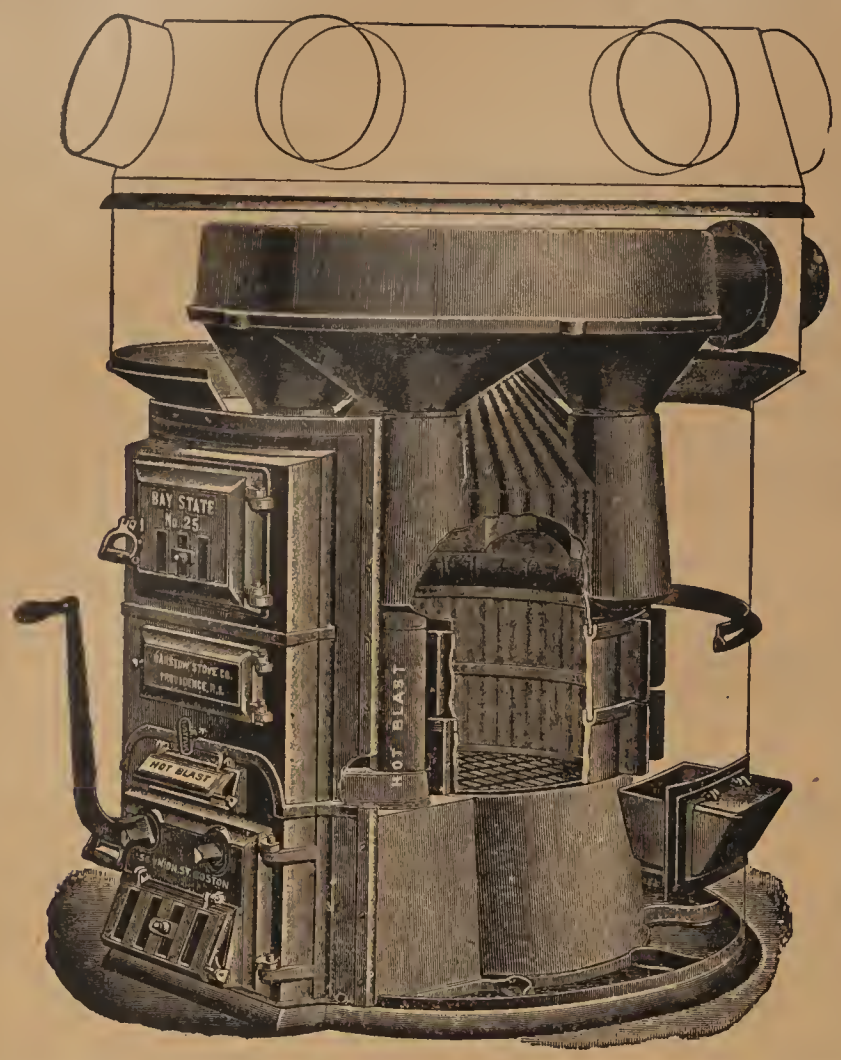
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"In one piece, with hook. Made fr
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BLUE FLAME OIL STOVES.



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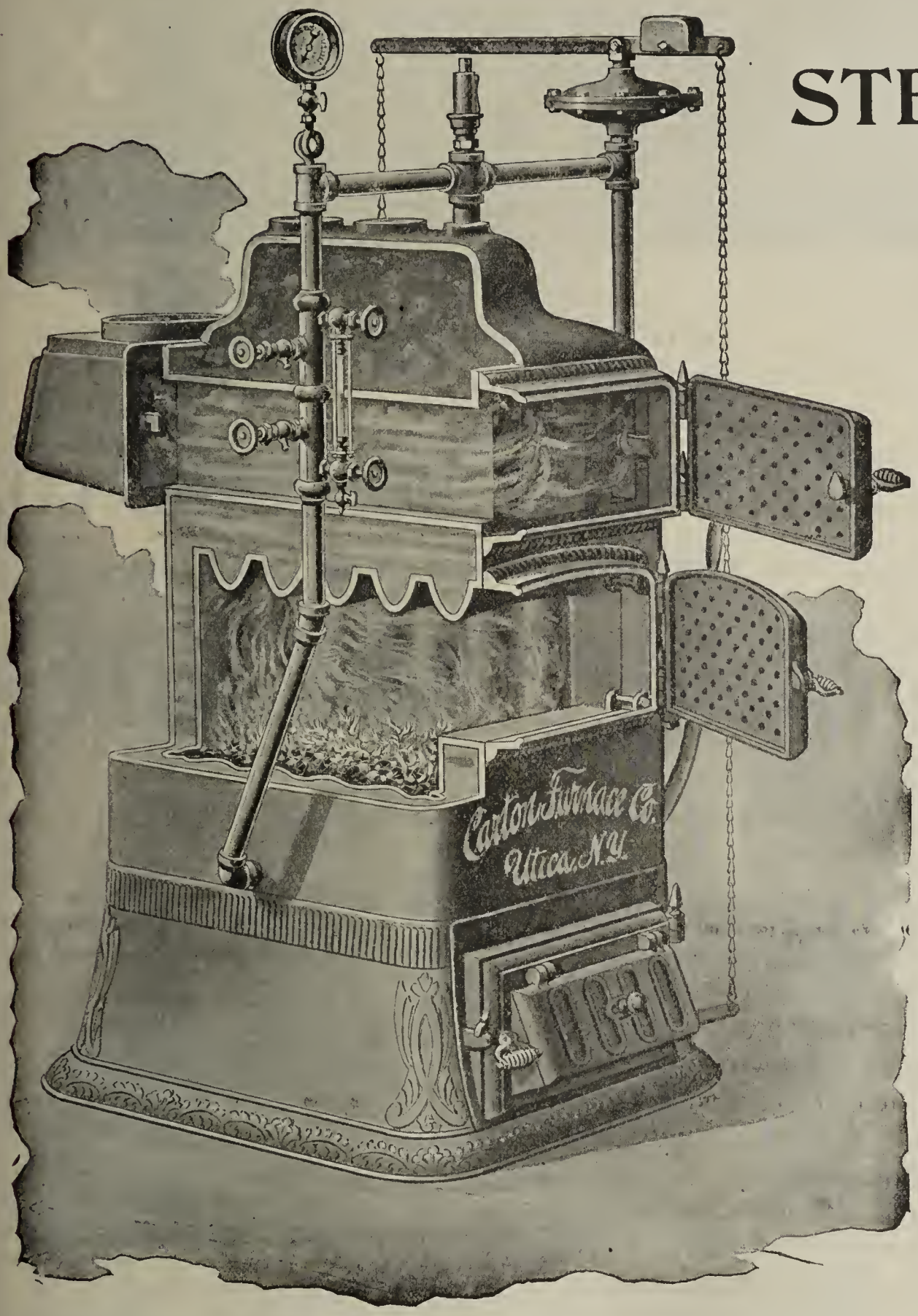
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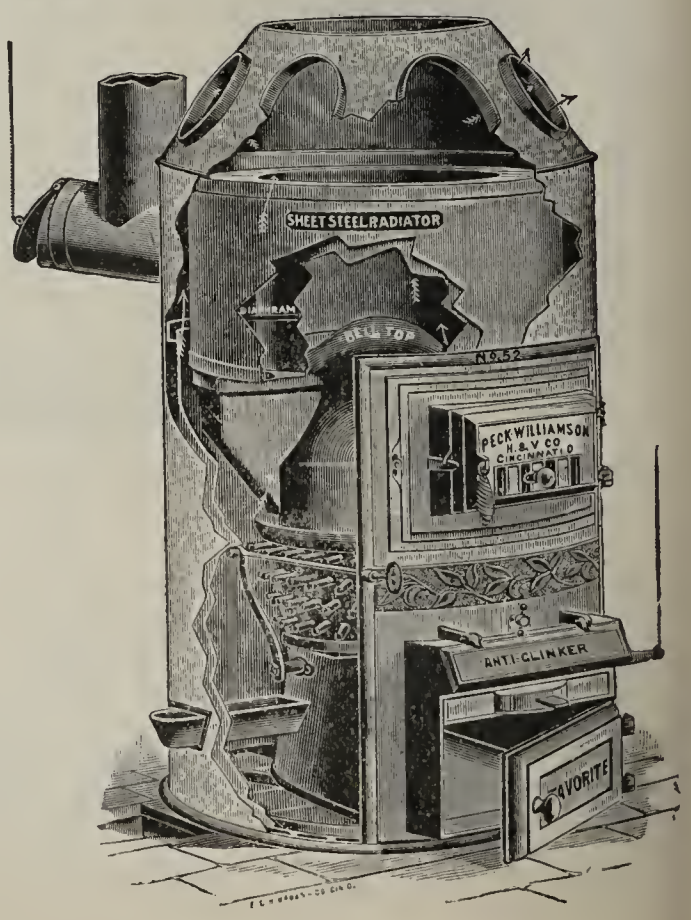
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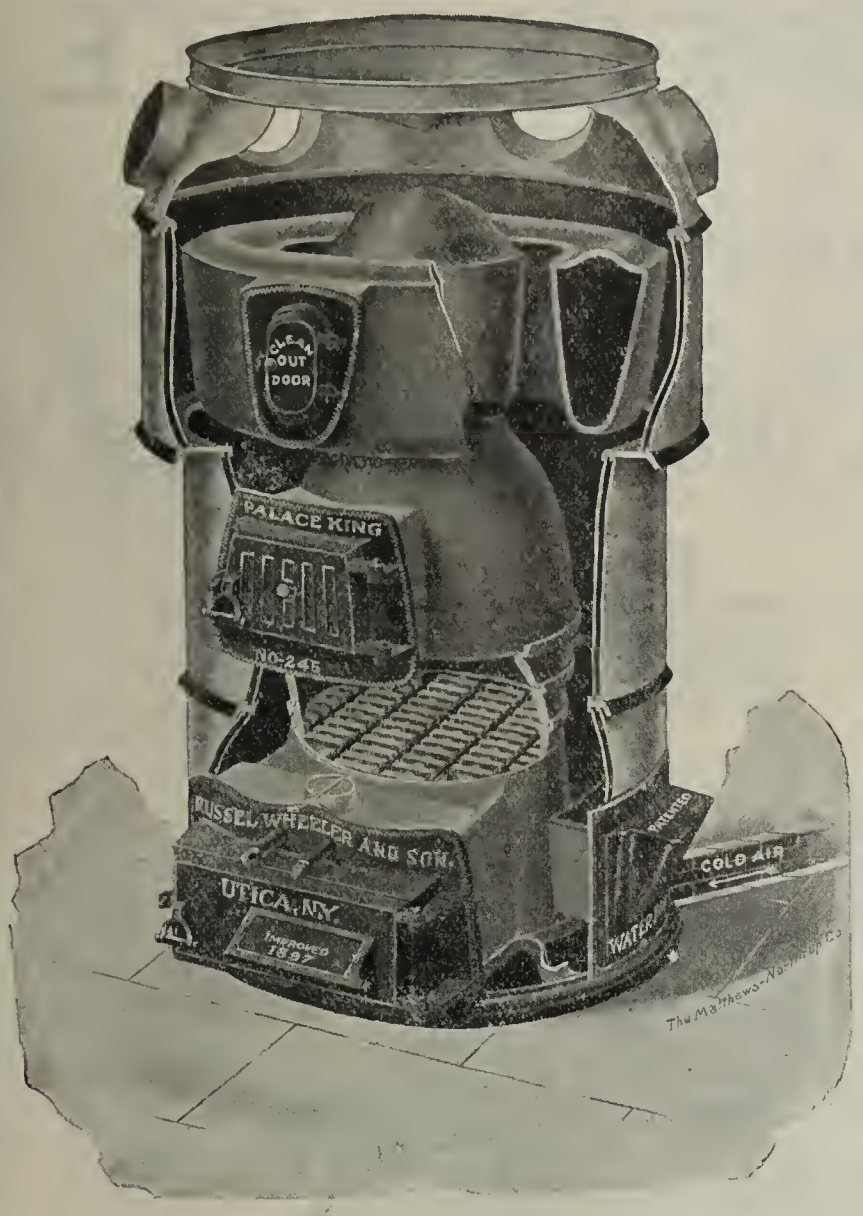
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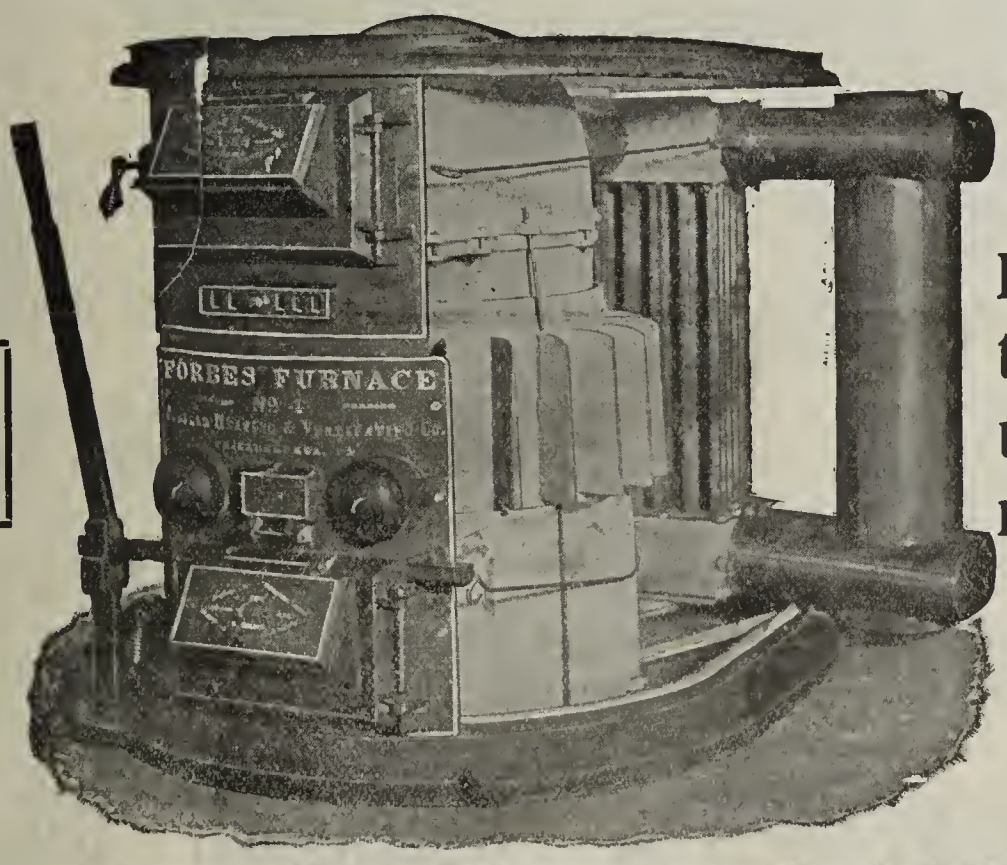
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FOR 1898.

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For Durability and Simplicity our Blue Flame Wick and Wickless Stoves are recognized as the best in the market.



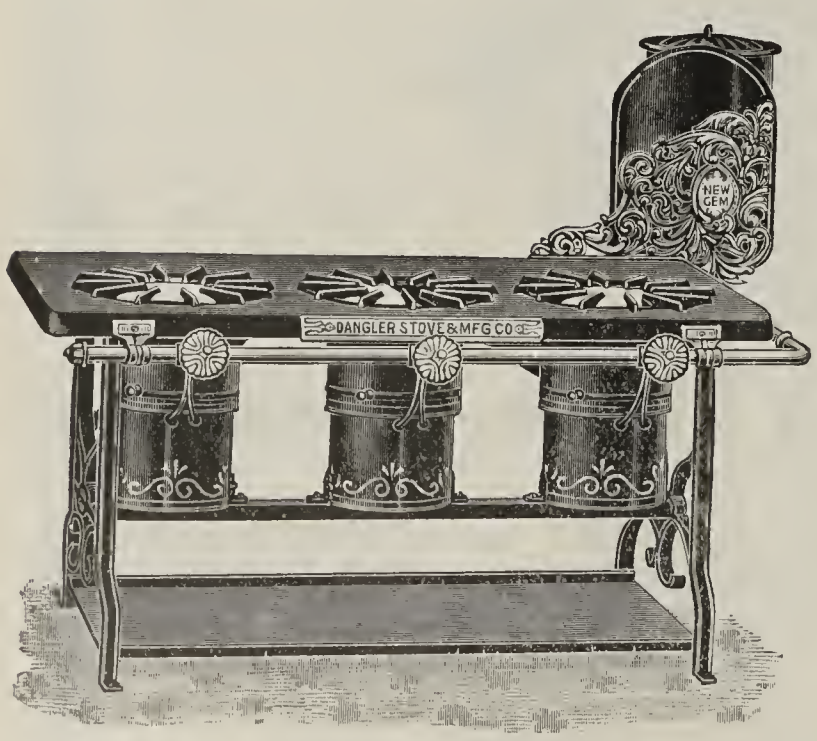
WICKLESS.

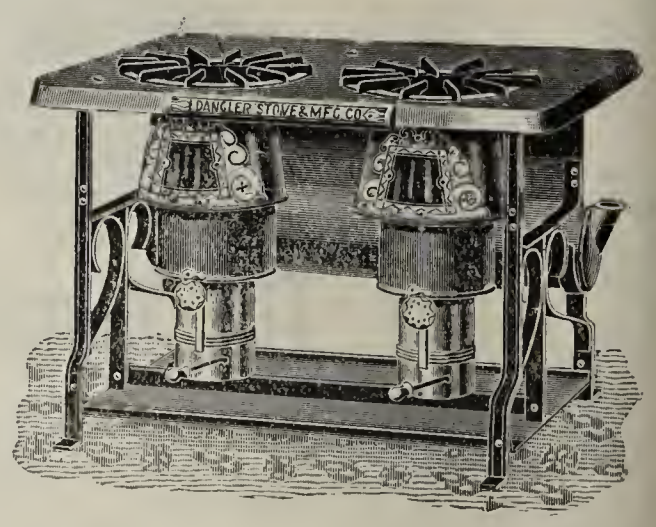
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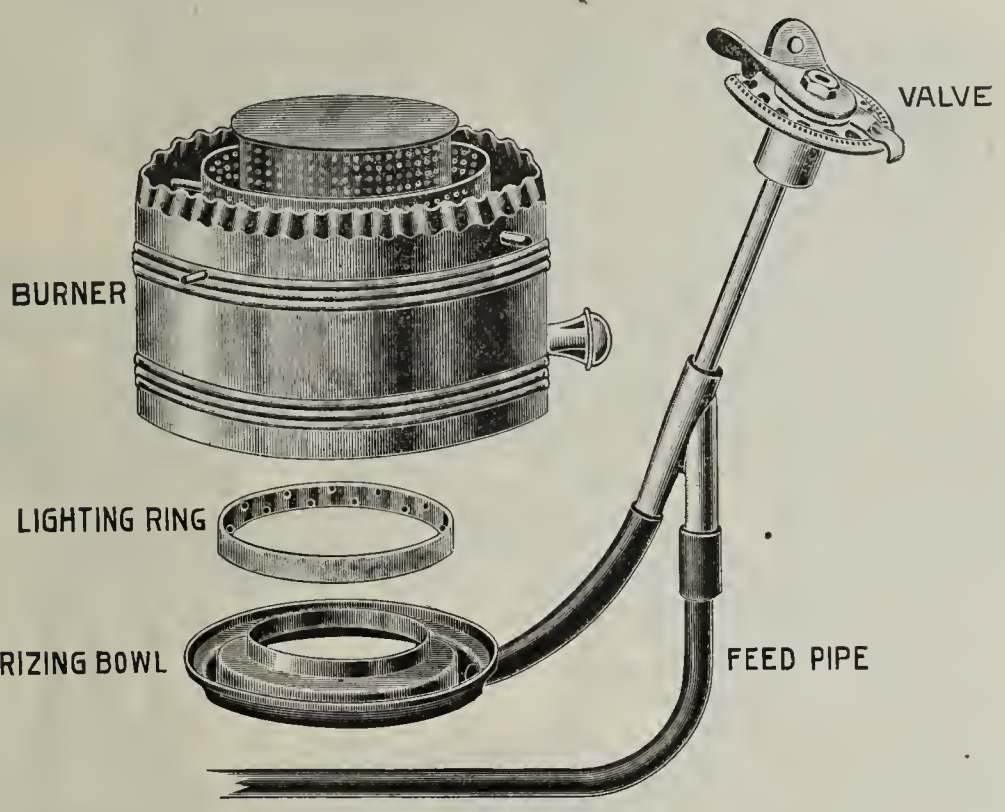
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The Puritan=Wickless

Blue Flame Oil Cooking Stove,

BECAUSE IT HAS NO EQUAL.



This is all there is to it

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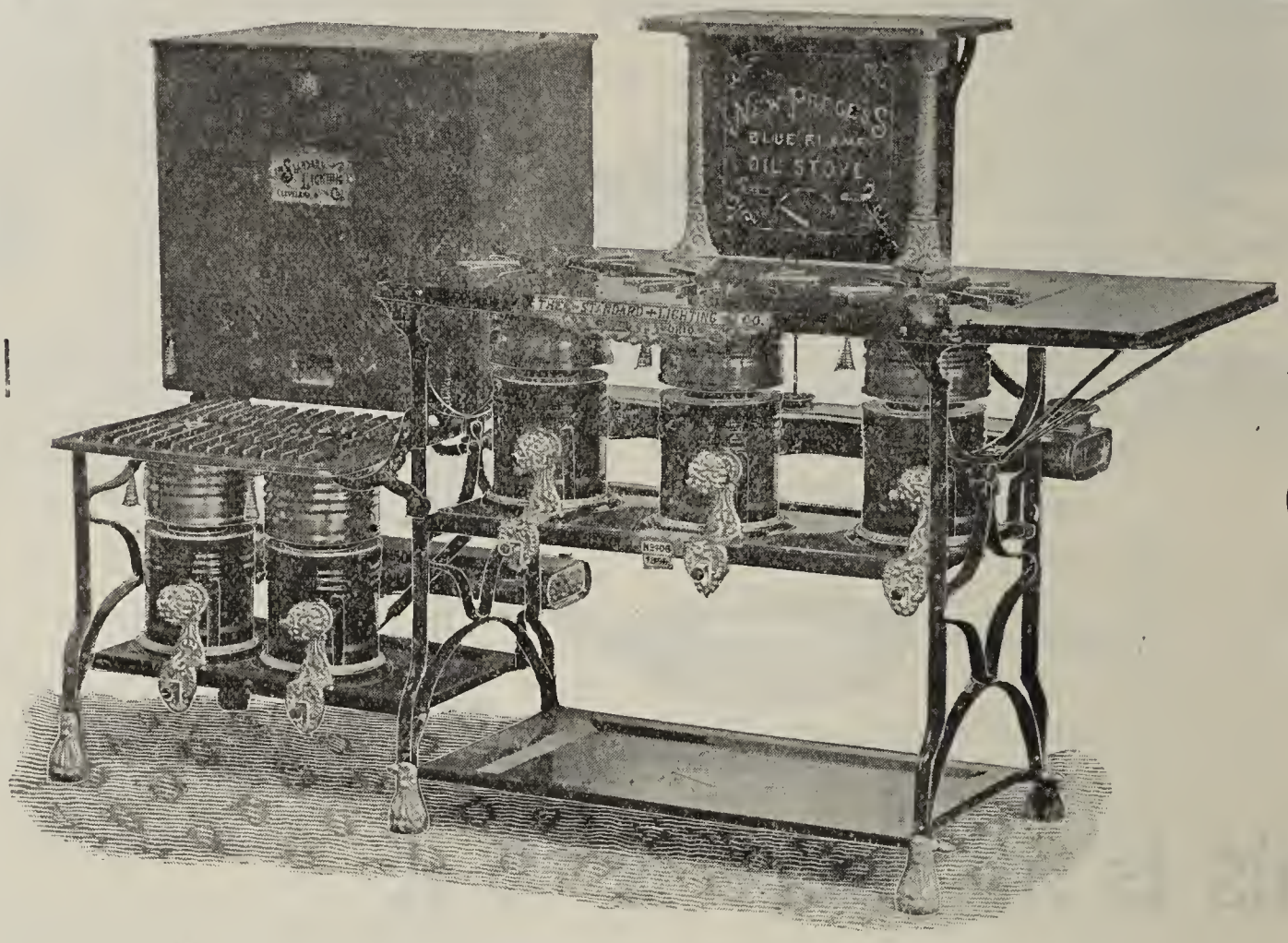
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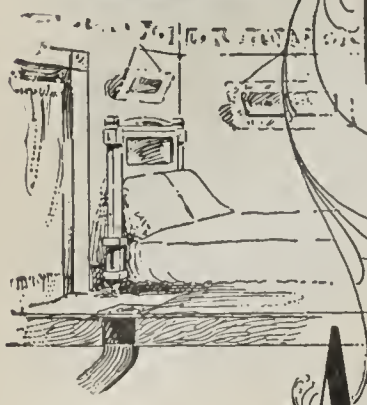
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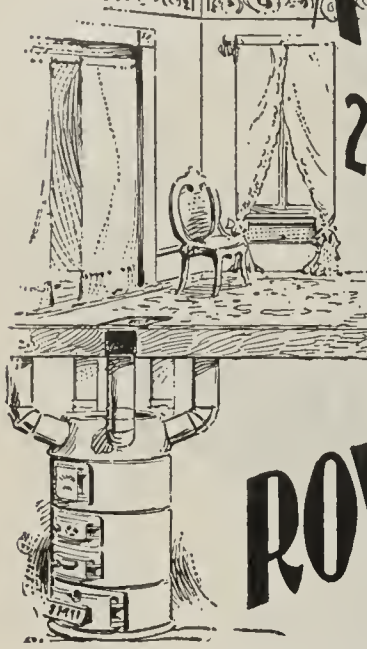


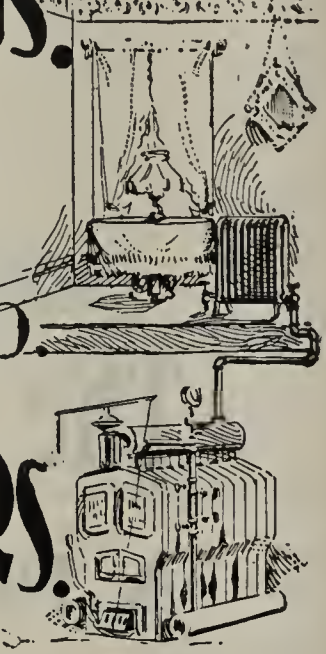


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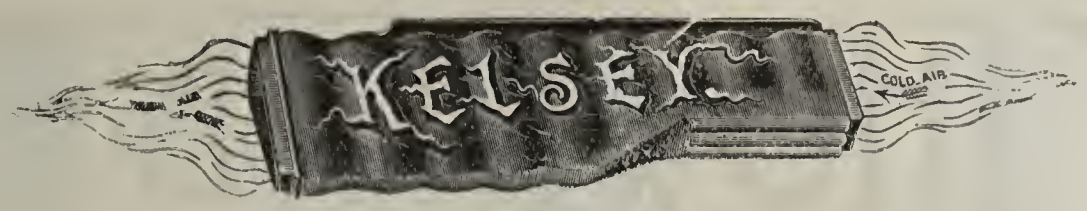


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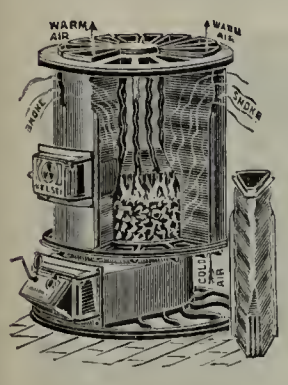


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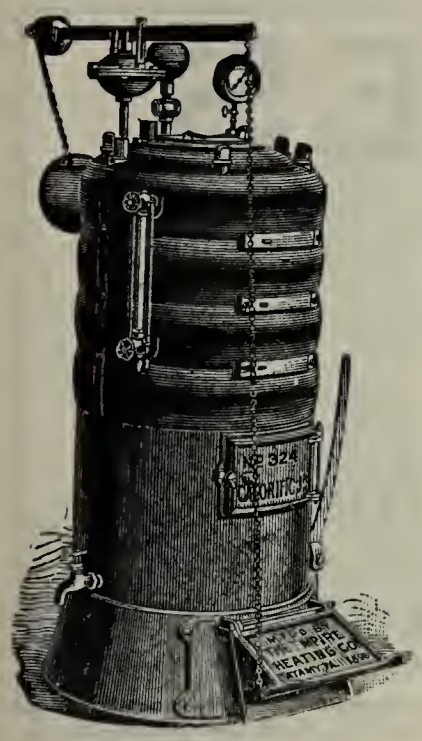
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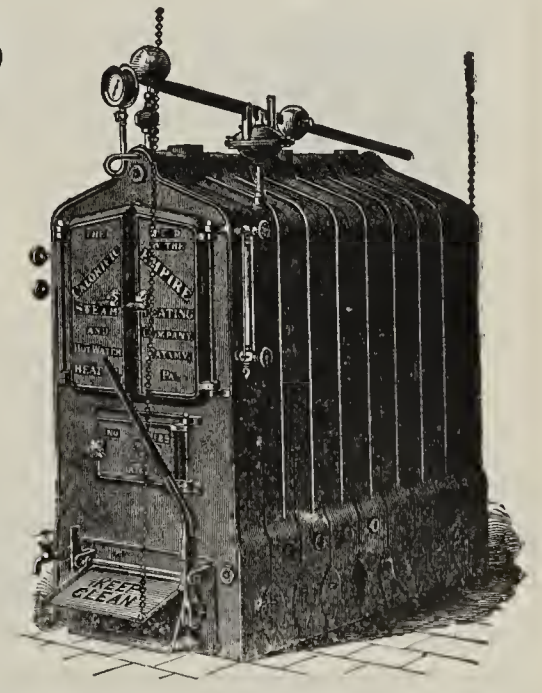
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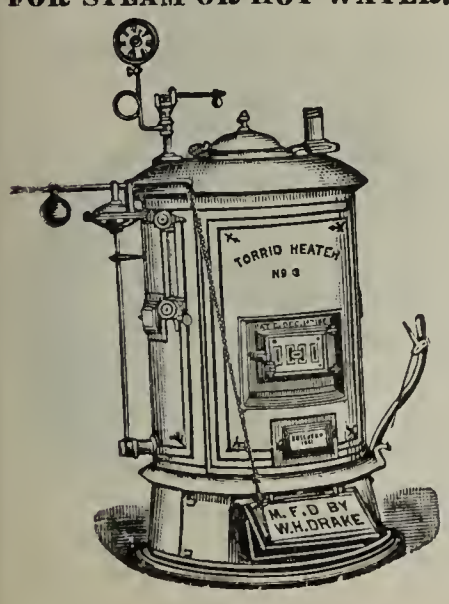
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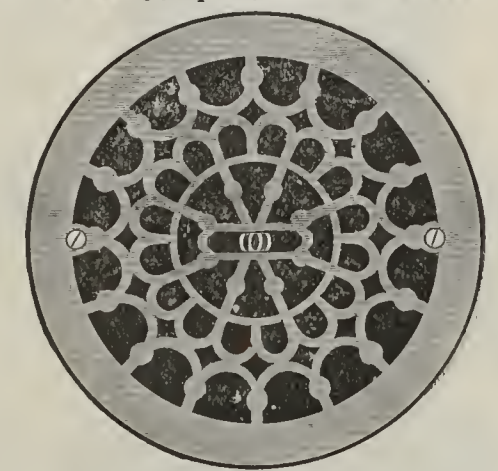
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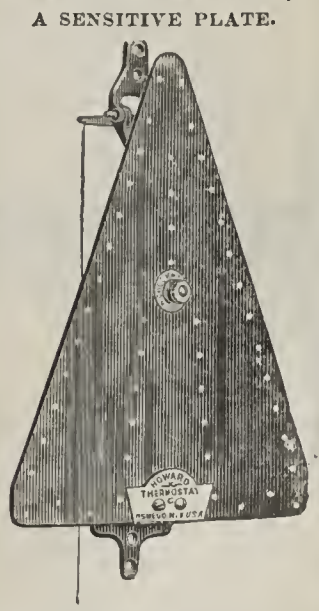
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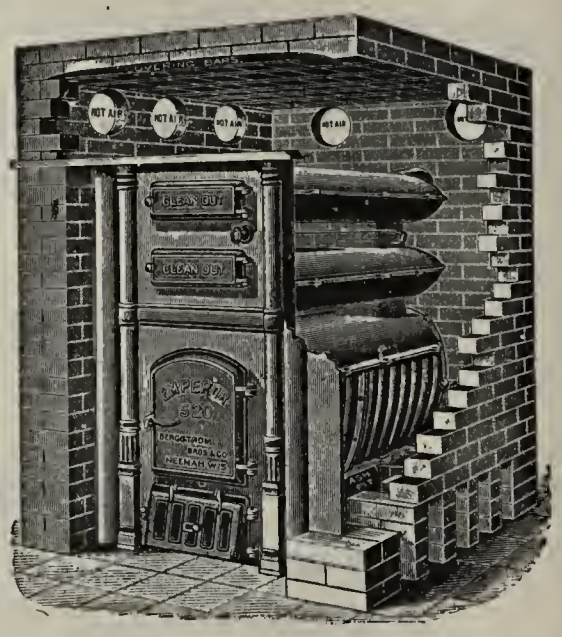
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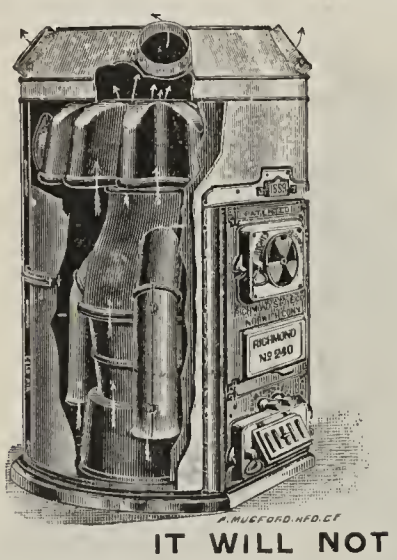
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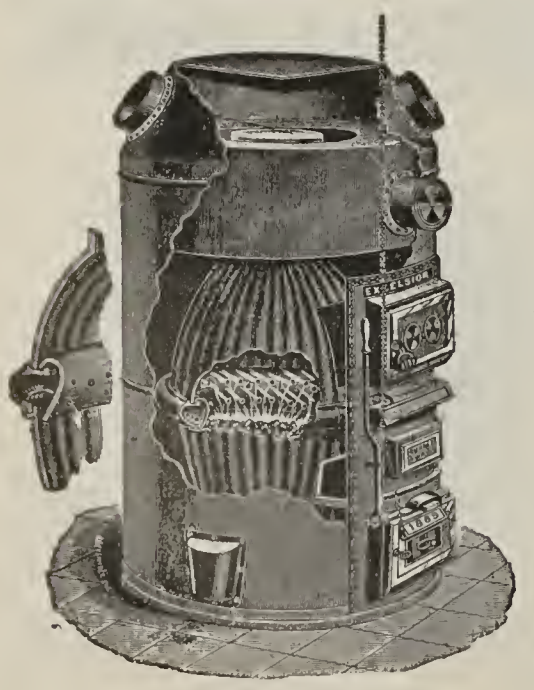
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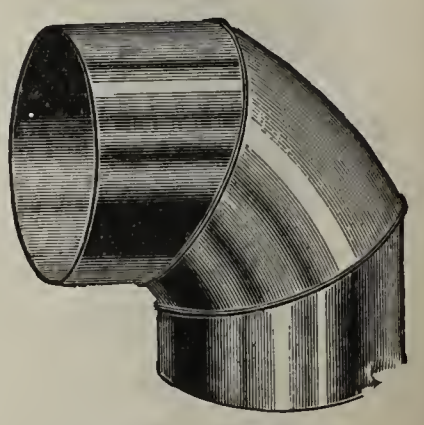
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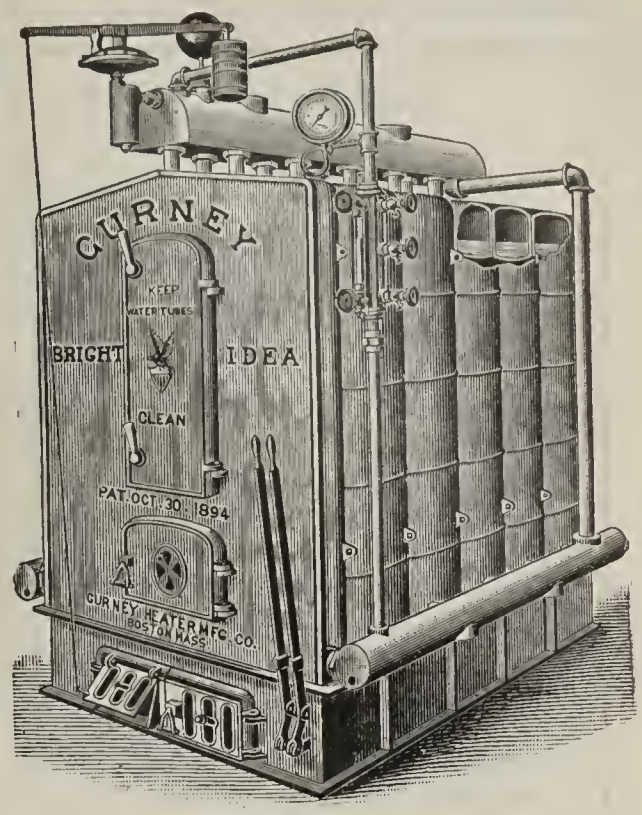
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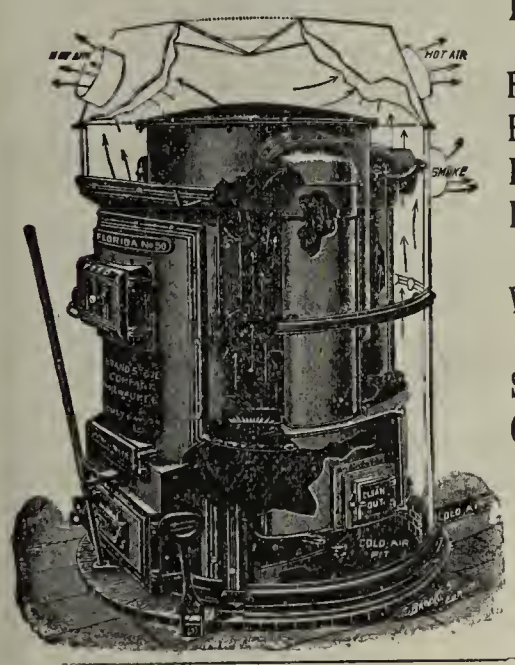
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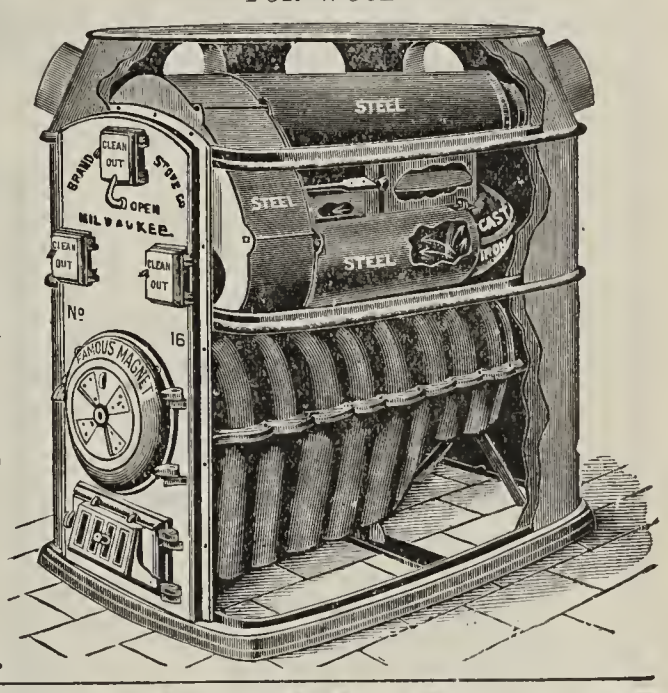
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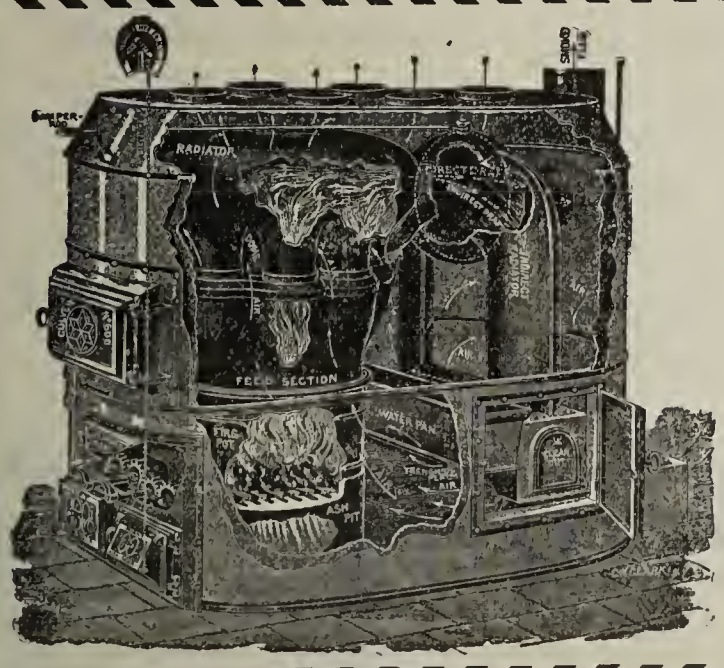
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" 6. Indirect Steam Heating.
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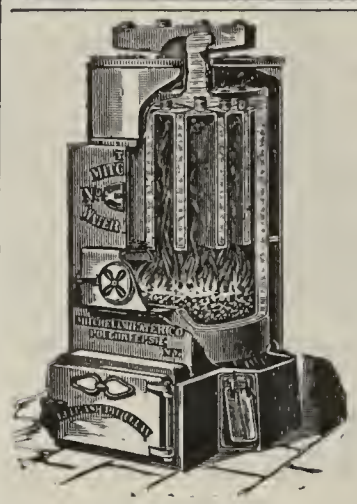
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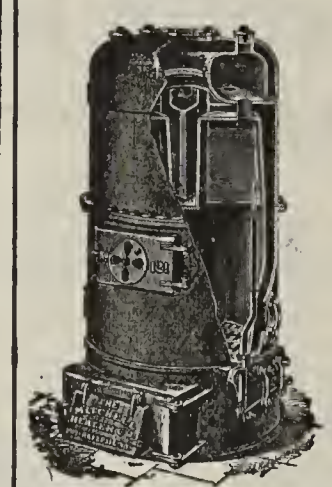
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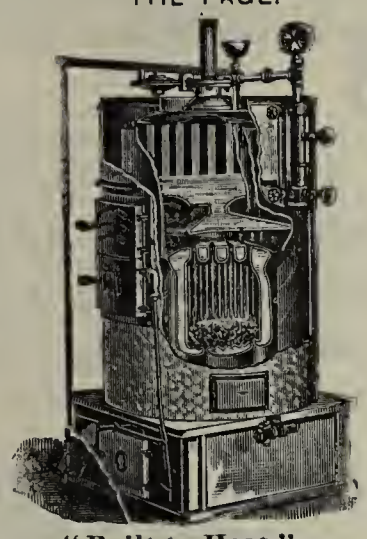
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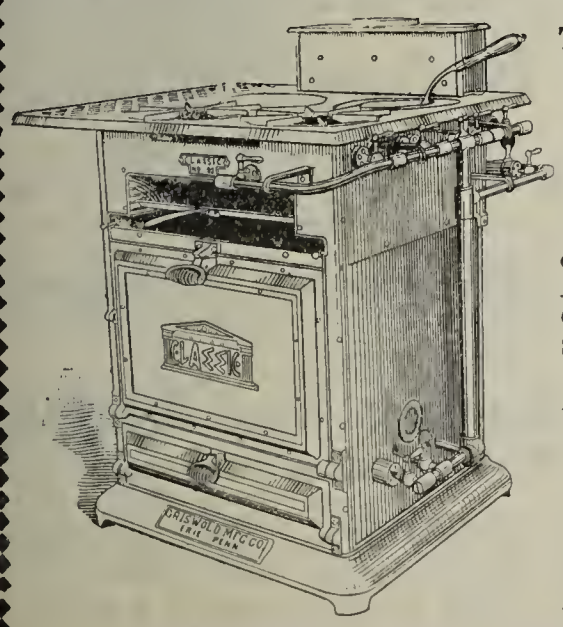
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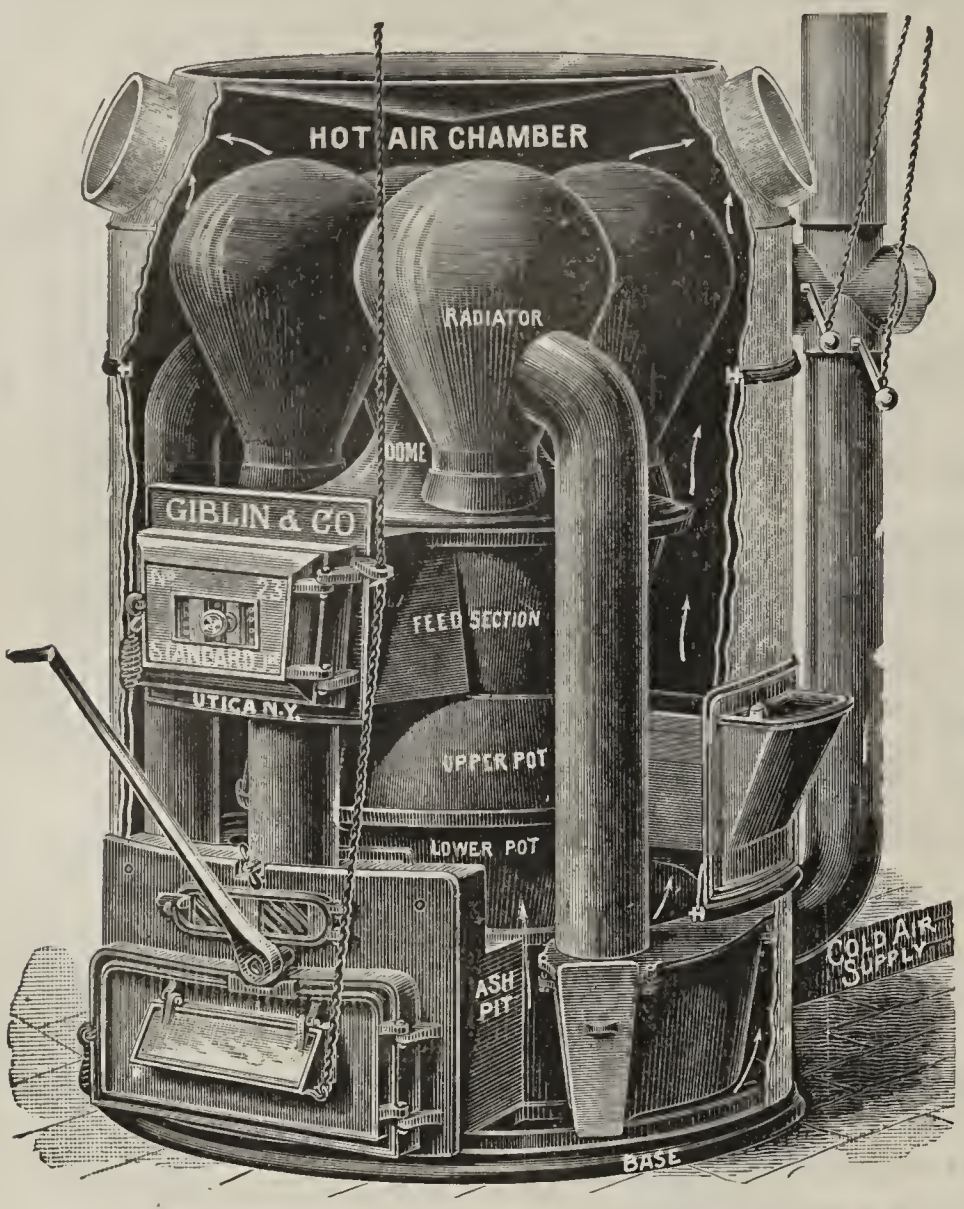
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CHICAGO: 84 Lake Street.
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THE COMBINATION HOT WATER HEATER

— FOR HEATING —

HOUSES, STORES, CONSERVATORIES and BATH ROOMS

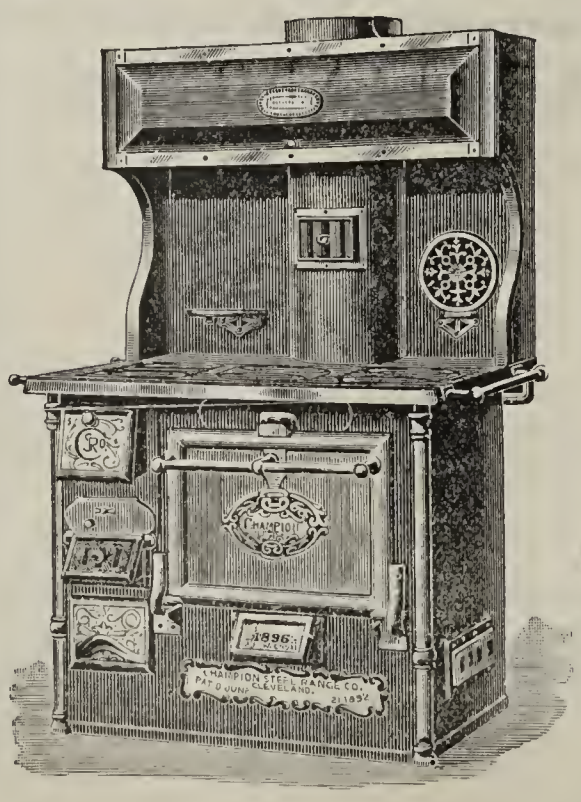
by the combination of hot air and hot water if desired, or hot water alone.

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Established, 1827.
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Manufacturers and Importers of
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Stoves were formerly considered luxuries. To-day people want something MORE SUBSTANTIAL and

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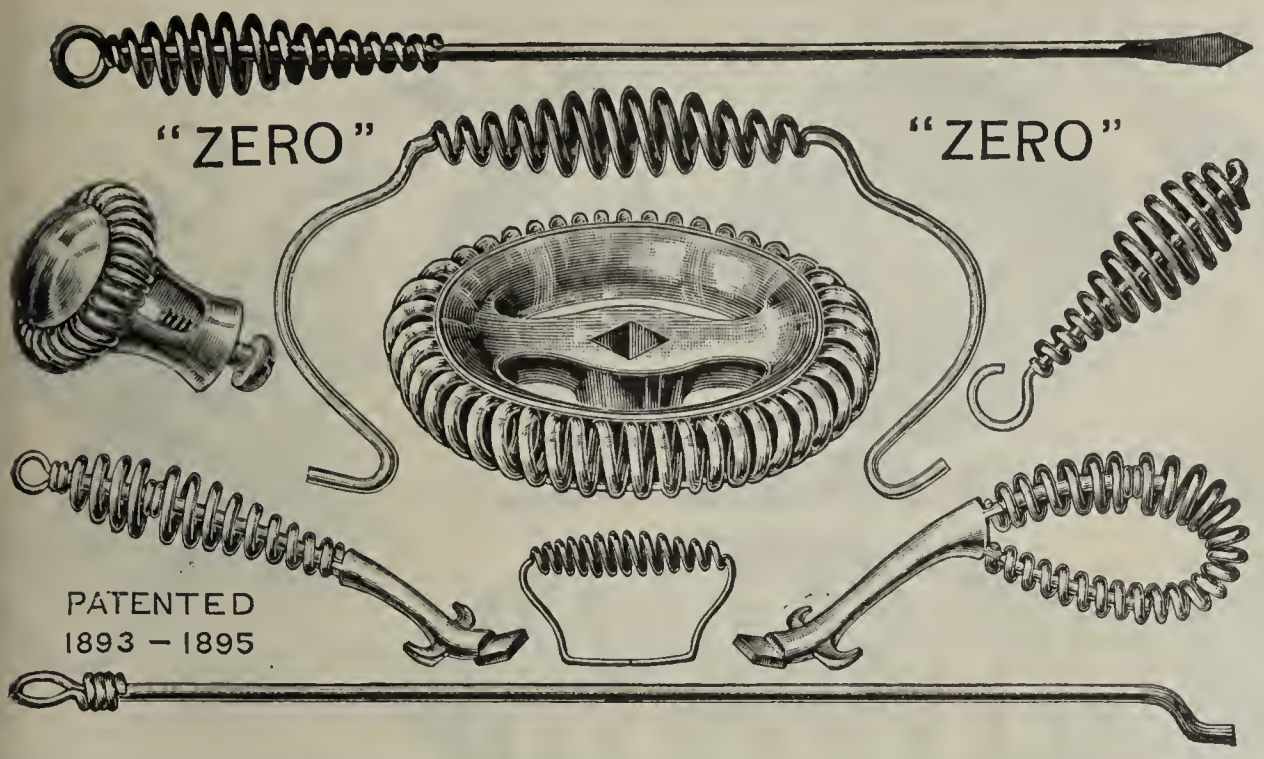
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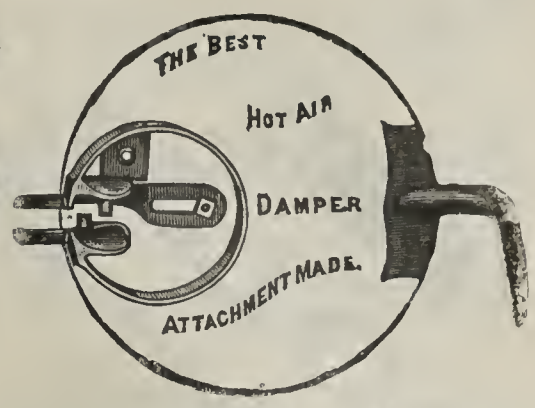
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When once introduced will sell themselves.
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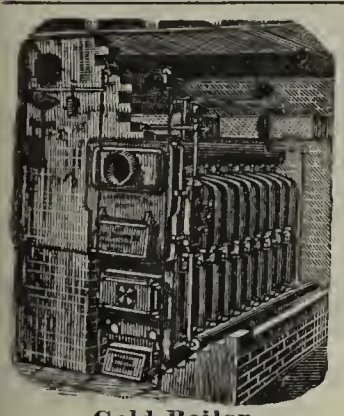
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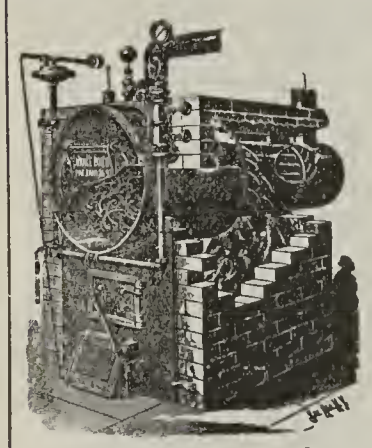
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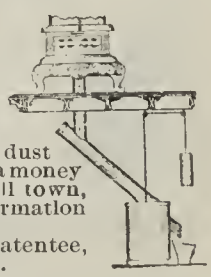
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Her Mother—O! I dunno. It must be an onhealthy business.

Sally—Why, ma?

Her Mother—Don't you allus see their names in the papers, tellin' how they've been takin' patent medicines an' tonics an' sech?—*Puck.*



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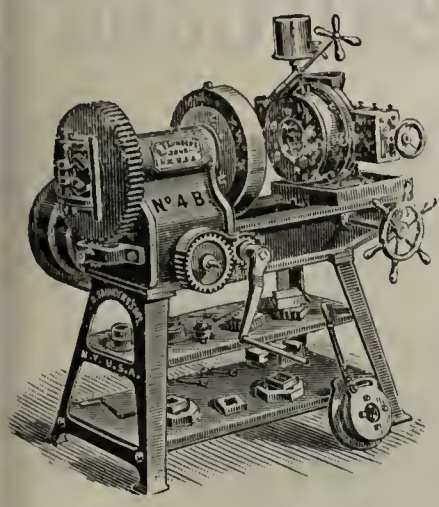
WAVERLY, N.Y.



—PHILOSOPHY FROM HARLEM.—Finnicus—I wonder why it is that those who attain the pinnacle of success never seem to be happy.

Cynnicus—Because the pinnacle of success is like the top of a particularly tall lightning-rod, with a particularly sharp point, and those who succeed in perching temporarily upon it usually find that they are targets for all the world's thunder.—*Harlem Life.*

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No. 4 B Machine, ¼ to 4 inch. Hand or Power.

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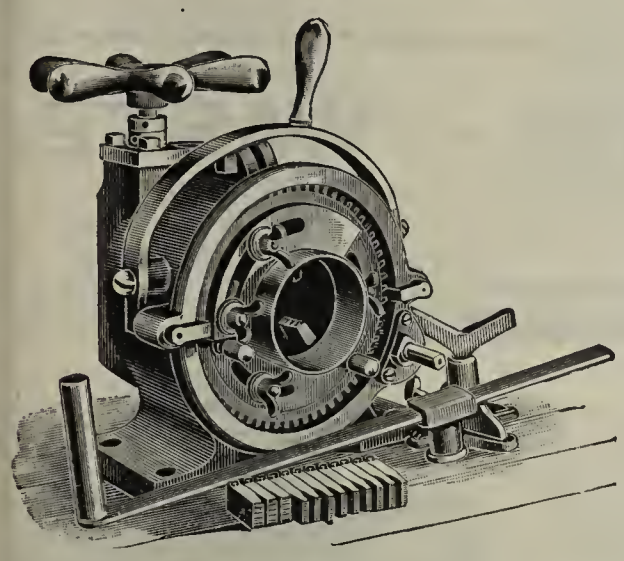
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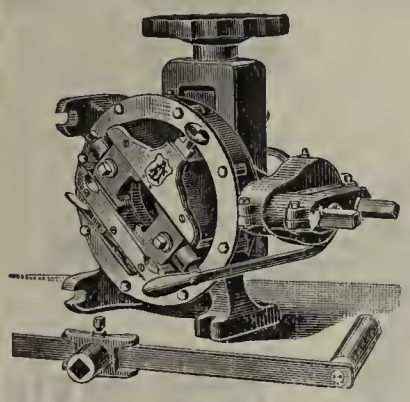
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WATER, STEAM and GAS FITTERS.

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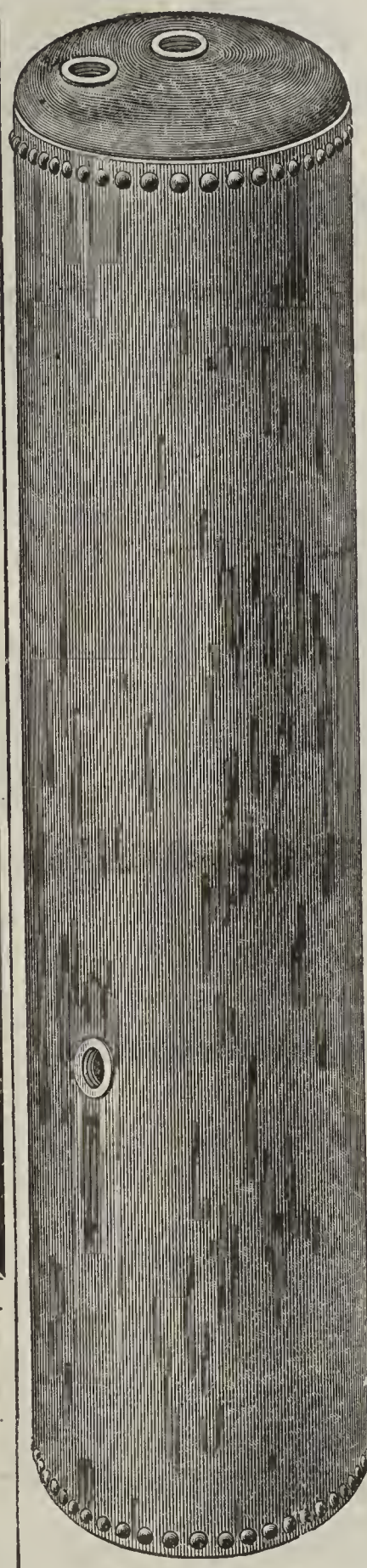
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GALVANIZED RANGE BOILERS.

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Every Pump Guaranteed for One Year.

Muddy Water Does not affect it.

The simplest, the Most Reliable, and the Speediest Pump on the market.

Great *Saving* of *water rent* under meter system.—Will produce 15 pounds air pressure in a 20-gallon air receiver with one stroke of the pump. Send for price, testimonials, and descriptive circular.

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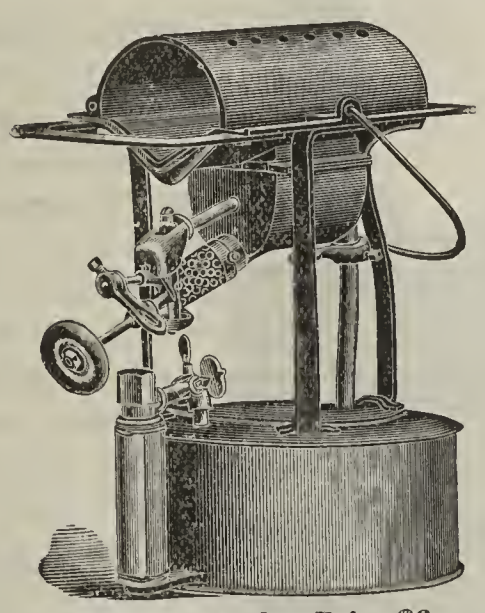
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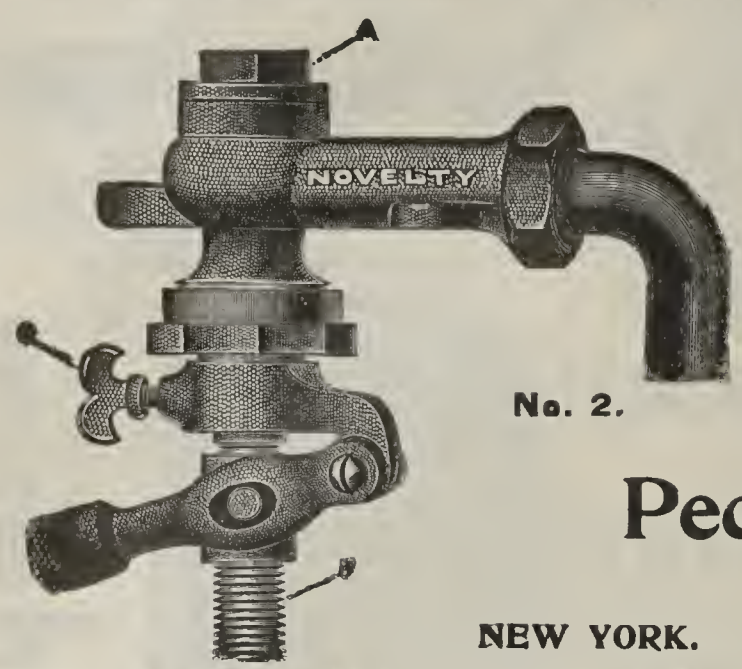
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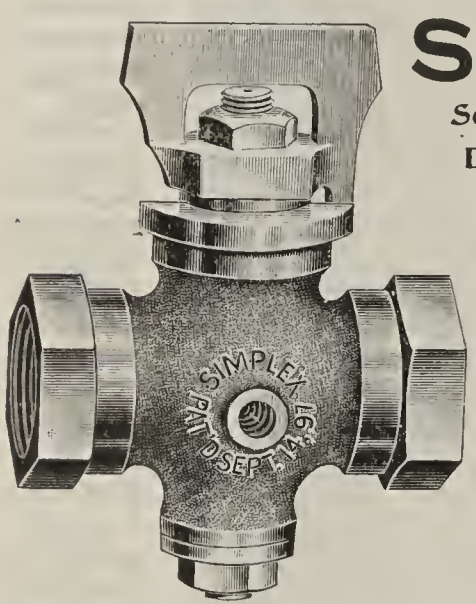
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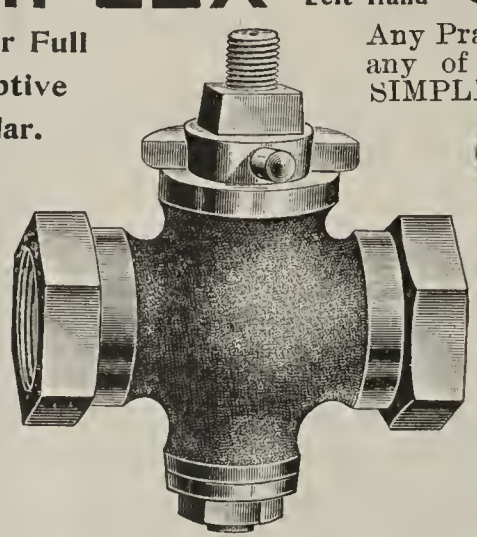
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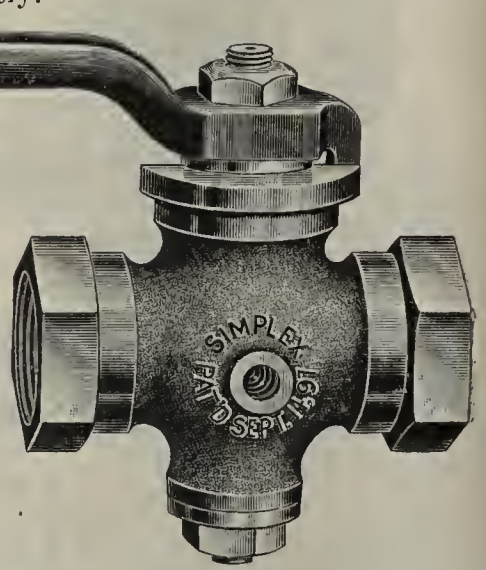
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Every one warranted.

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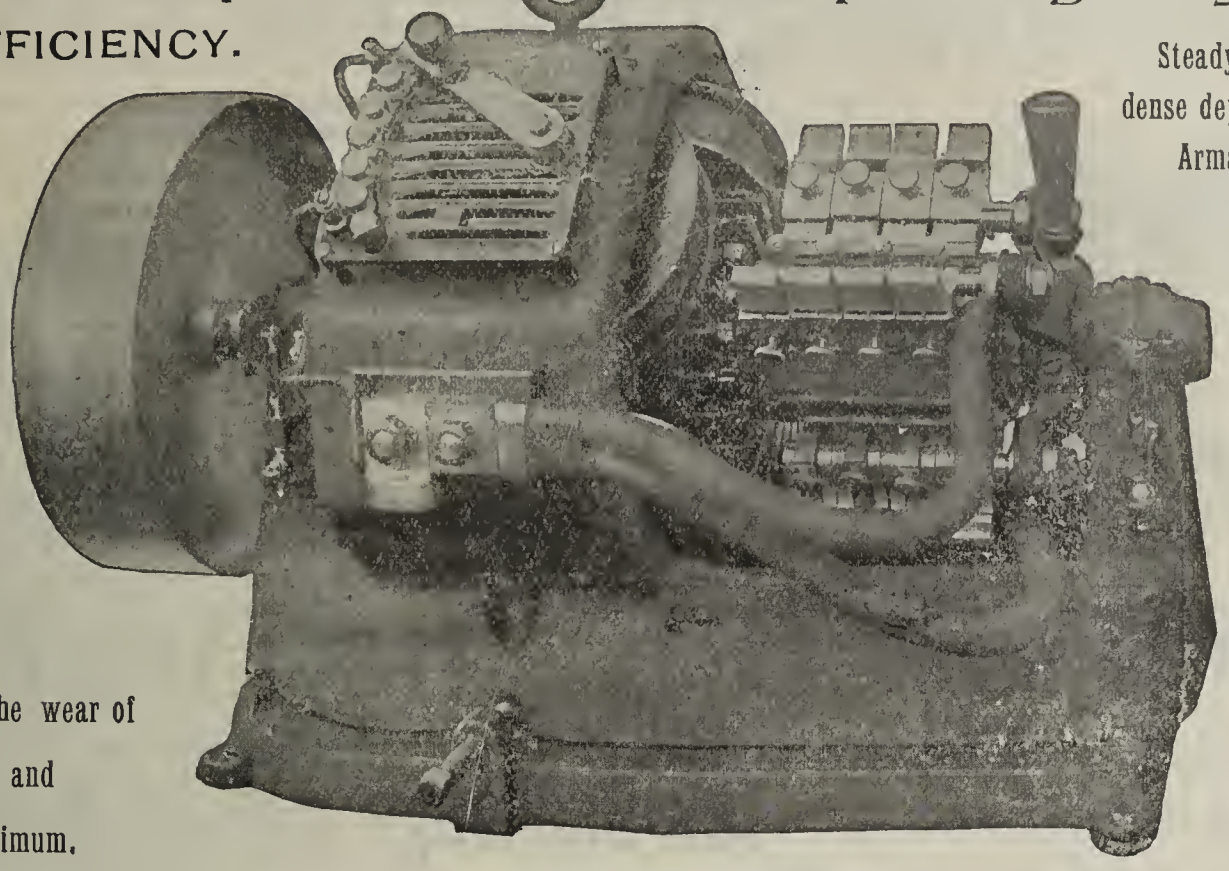
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Steady current, producing a dense deposit of even color.

Armatures bar wound, rendering mechanical and electrical injury practically impossible.

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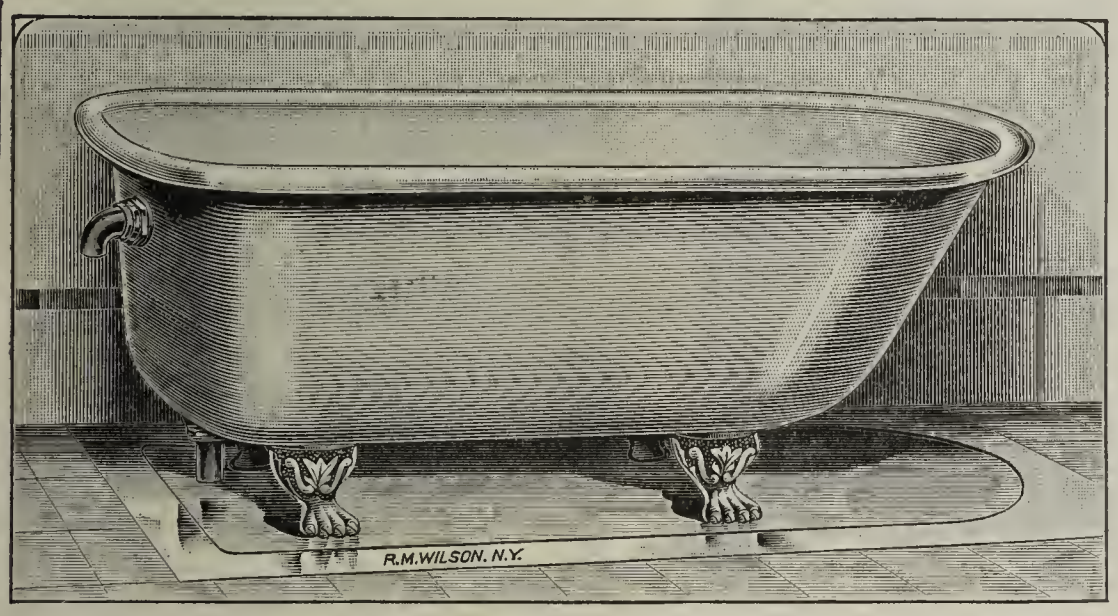
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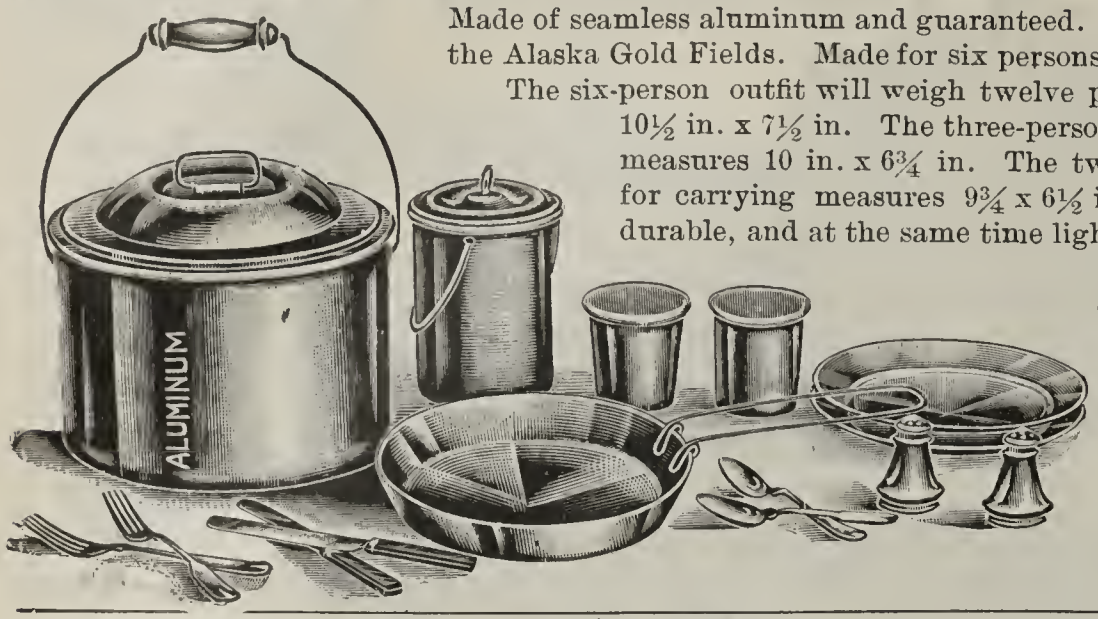
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The six-person outfit will weigh twelve pounds and when packed for carrying measures 10½ in. x 7½ in. The three-person weighs 6½ pounds, when packed for carrying measures 10 in. x 6¾ in. The two-person weighs four pounds and when packed for carrying measures 9¾ x 6½ in. No solder used, nothing to rust, strong and durable, and at the same time light and convenient to carry.

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THE ILLINOIS PURE ALUMINUM COMPANY,

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REFRIGERATORS.

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IN ALL IMPROVEMENTS.

Hard and Soft Woods . . . .

Some Exclusive Points of Excellence.



New Columbias,
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Patented Removable, Cleanable, Ice Chamber. New Patent Automatic Siphon. New and Rich Carvings. Oxidized Trimmings, Perfect Wood Felt and Charcoal Sheathing Insulation. Fine Finish.

Price All Right.

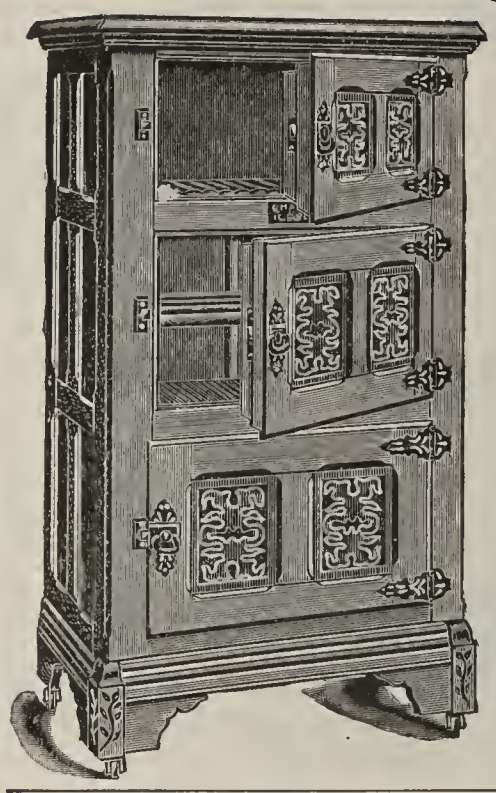
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The Challenge Iceberg Refrigerator.



Large dealers in first-class refrigerators will do well to ask for our 1898 catalogue and discounts.

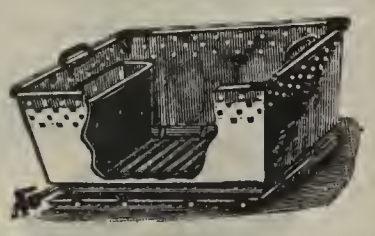
WRITE TO THE

Challenge Corn Planter Co.,

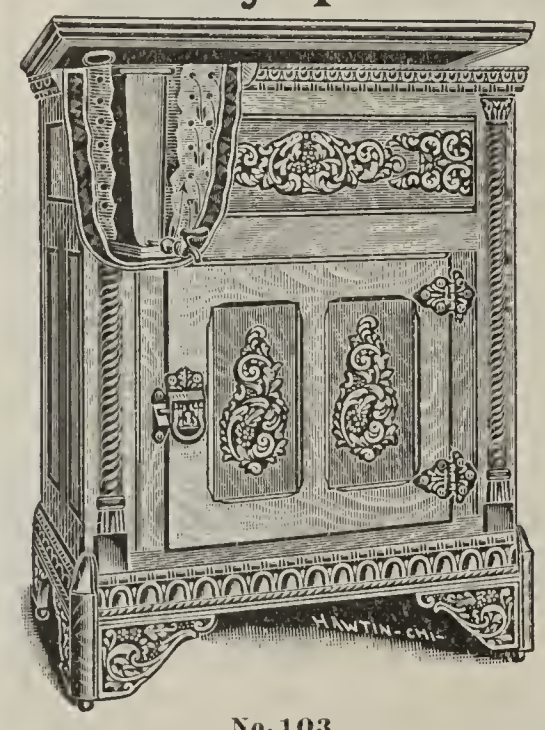
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The Gurney can be kept absolutely pure and clean

By the use of the



Removable Galvanized Ice Compartment



No. 103

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All users testify to the GURNEY'S many points of superiority.

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Buy the Gurney Patent Refrigerator. It costs no more than imitations claimed to be "*made like the Gurney.*"

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IN NEW DESIGN FOR 1898.



Has Patented Removable Galvanized Ice Compartment, is the Neatest, Strongest, Best and Only Perfect and Practical Ice Compartment Made.

It also has a Separable Removable Porcelain-Lined Water Cooler, found in no other.

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No weak attached bottoms to become bent and out of order, as is the case in similar old style devices.

By our superior construction the lowest temperature, quickest drainage, driest air and best circulation, with the least consumption of ice, is obtained in the shortest possible time.

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The walls are lined with charcoal sheathing, and filled, including bottoms. with mineral wool, the best non-conductor known to science.

Also fitted with center removable shelf rest to accommodate parted shelves for convenience in storing jars, etc.

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—"Of course, I will be homelier some day, dear," she whispered.

"Impossible," he replied gallantly, and he marvels that she sent his presents back.—*Detroit Free Press.*

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Neatest, Simplest and Cheapest.

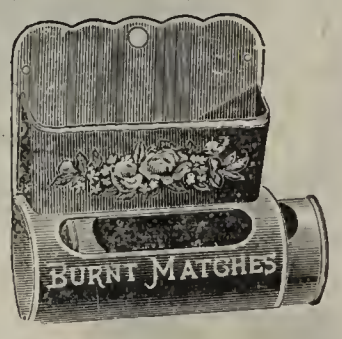
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MILWAUKEE R. R. MILK CANS.

A PERFECT CAN AT A MARVELOUS PRICE.



Iowa Pattern.

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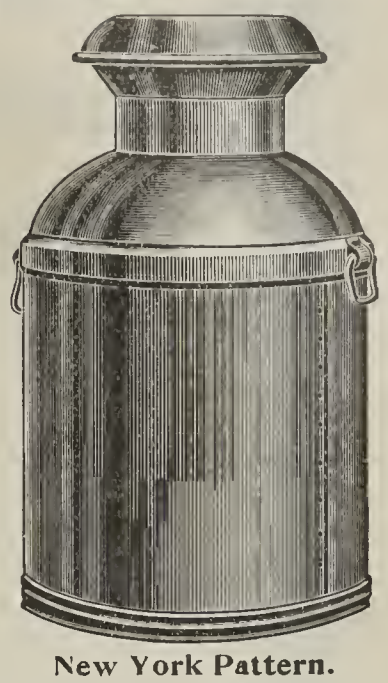
is made of heavy wrought steel. The neck and bowl, which is drawn in one piece, is double seamed to the breast, and the breast is double seamed to the body in such a manner as to form a very strong and rigid edge, and is protected by a heavy beveled edge iron band. The body and bottom rest on the O. G. heavy iron bottom band. The can is put together in the black and then double tinned very heavily, making it the strongest, most perfect and durable can on the market.

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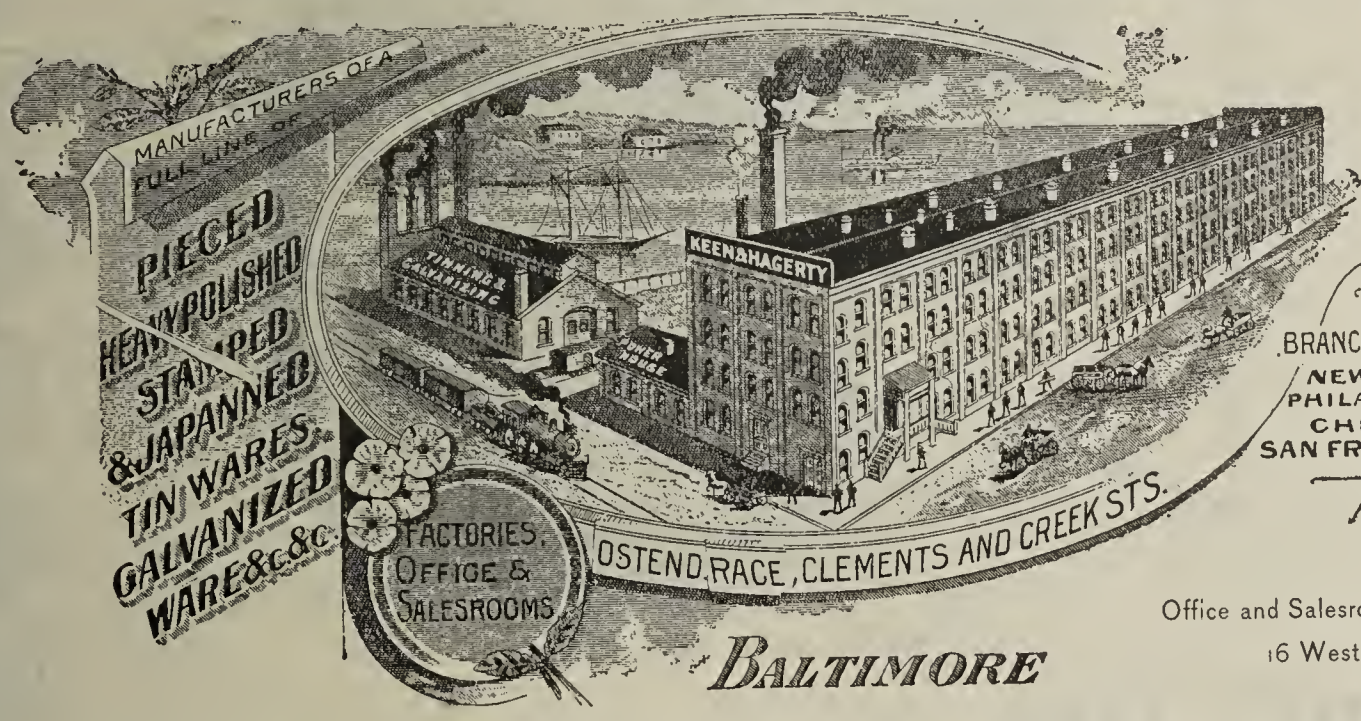
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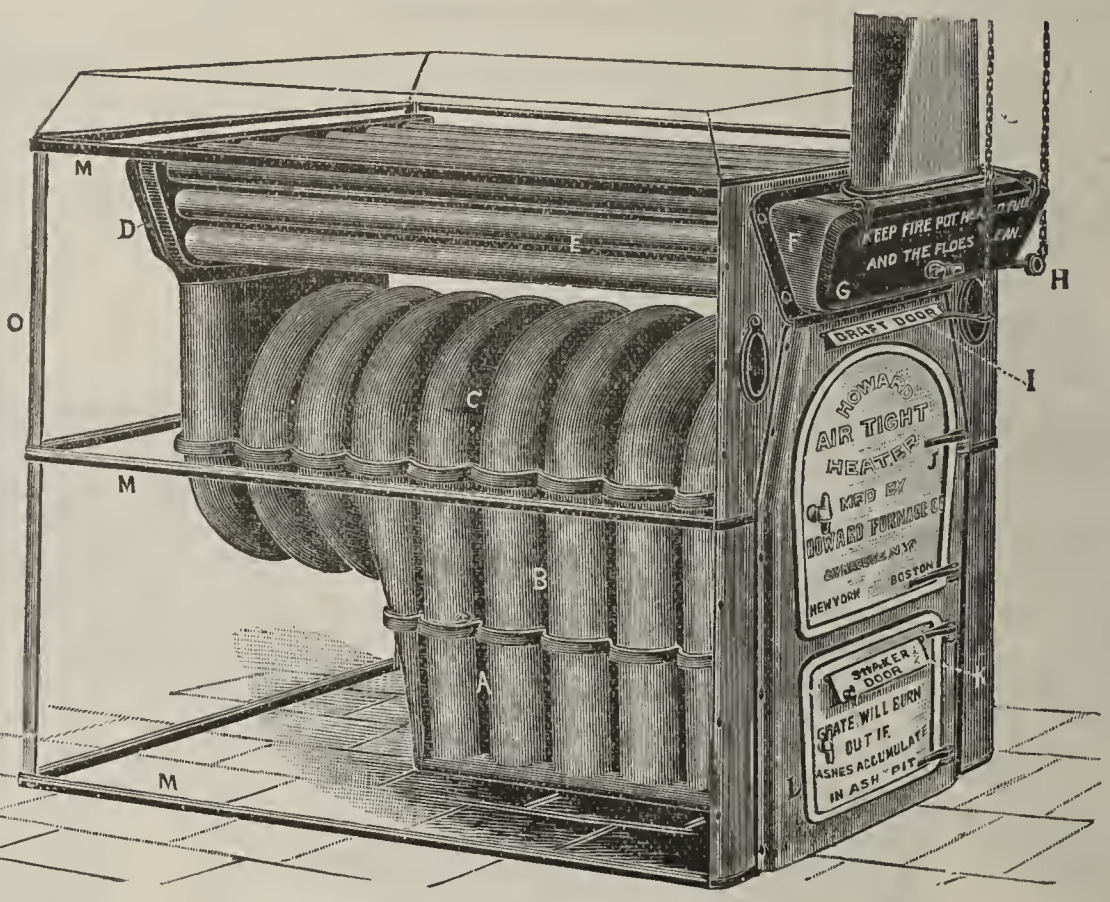
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PATENTED JULY 13th, 1897.

Start the New Year

with our line of tubular construction. It will bring you business away from the best of them. Try it. A letter of enquiry is solicited. Already the reports come to us, telling how well these furnaces act. If you want letters of commendation, we can furnish them by the score. We believe we can satisfy anybody as to their worth. Why not you?

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198 Spruce St., Sta. H (Chelsea).

THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, February 19, 1898.

DAVID WILLIAMS COMPANY, - - PUBLISHERS.

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BRITISH AGENCY: The Ironmonger, 42 Cannon Street, London, England.

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Index to Reading Matter.....Page 57.

The Business Situation.

Business conditions continue to display a steady and satisfactory improvement. The volume of general trade, as shown by bank clearings, is larger than ever before at this season. Last week's aggregate of clearings was 54.7 per cent. greater than for the corresponding week of 1897, while the month, so far, shows a gain of 44.3 per cent. over last year and 16 per cent. over 1892. Commercial loans show a notable expansion, the demand for money for mercantile and industrial employment being unusually active. Spring trade has already begun to move in various quarters, with an excellent outlook for a large volume, not only in the West but also in the Central and Southern sections of the country. The annual mud blockade, however, in the West and Northwest, is reputed to have set in and this is likely to interfere with the distribution of merchandise for some weeks to come. In the East improvement in trade, while clearly visible, is not so pronounced as elsewhere, while the weather has had a restrictive influence on business in some quarters. A notable feature of the week has been the Leiter corner in wheat, which has sent up the price of the cereal in Chicago to the highest point since 1891. Corn has also advanced nearly 1 cent a bushel. At the same time the export movement of grain continues surprisingly large in the face of the recent advances. A rise of 5-16 cent in the price of cotton imparts a more cheerful tone to the business situation in the South, where the low price of that staple has exerted a restrictive influence on trade for some time past. Railway earnings continue to show steady and substantial gains, which are likely to be progressive. Prices in general display a more definite upward tendency, especially in the iron and steel and metal markets. Only tin plates remain in the rut. On the Stock Exchange, early in the week, there was an active investment movement in the best securities, both by home and foreign buyers, with higher prices, and speculative business asssumed large proportions, helped by the continued ease in money rates. The lamentable occurrence at Havana, however, had a depressing effect in Wall street, and stock values reacted materially in the latter half of the week, owing to the fear of international complications arising from the destruction of the battle ship "Maine."

Fires in High Buildings.

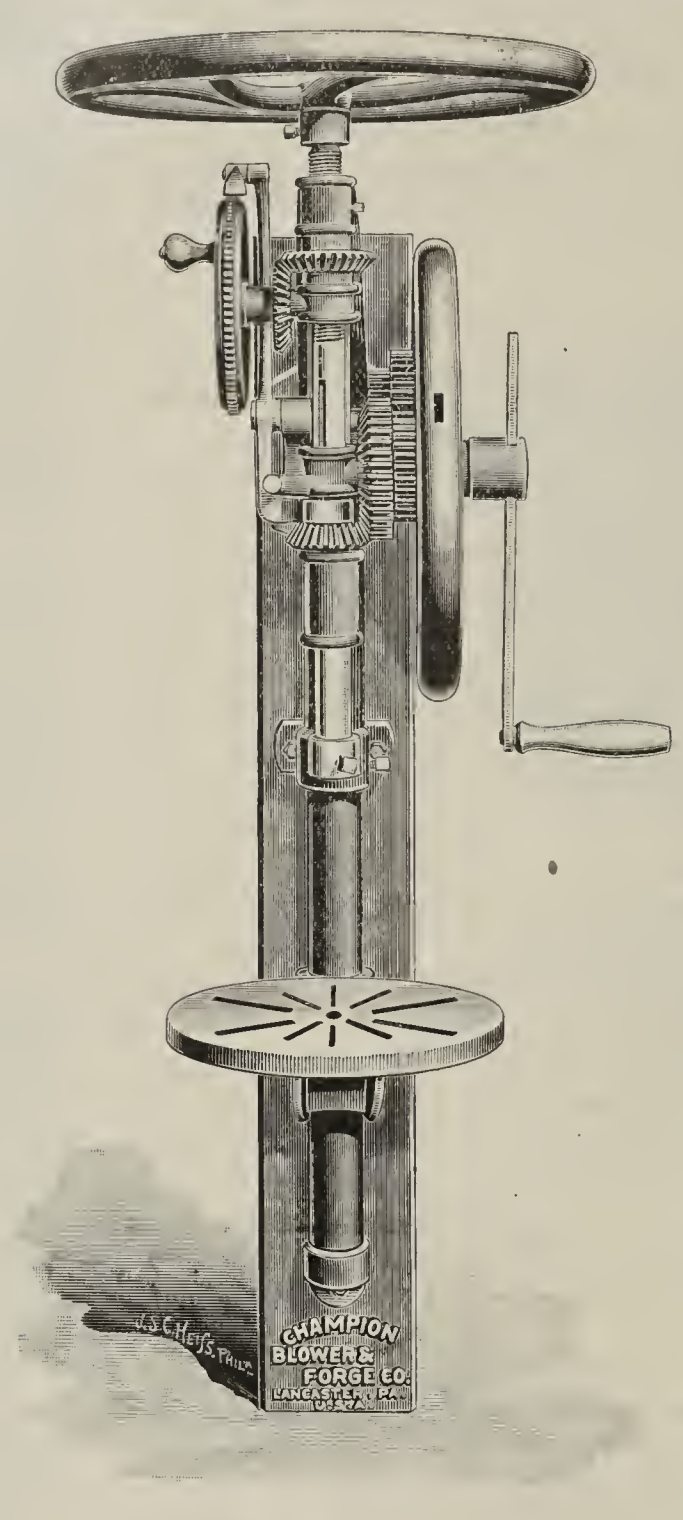
The destruction last week of another so-called "fire proof" business structure in New York City affords an additional illustration of the practical impossibility, under the present conditions, of checking a fire when it attacks the upper floors of a modern "sky scraper." Since business buildings have towered to a hight of over six stories the difficulty of providing adequate fire protection has become almost insuperable. Chief Bonner, of the New York City Fire Department, than whom there is no higher authority in these matters, does not scruple to declare that none of the modern "sky scrapers" are fire proof, and that once a fire gets a good start in one of the upper stories nothing can be done but to let it burn. He holds that it is utterly impossible to fight a fire above a distance of 125 feet. The only remedy that is suggested is the adoption of interior fire plants and the organization of a fire corps of employees to operate them in case of an outbreak. A number of the high modern buildings in New York are already supplied with interior stand pipes and the necessary equipments, but the majority of the owners of such structures are content to depend upon the so-called fire proof construction of the walls and floors, a protection which time and again has been proved fallacious in actual experience. The insurance companies are actively working in this matter, however, and it is not unlikely that pressure will be placed on the Building Department to compel owners of buildings over six stories high to provide their own fire fighting apparatus. It is not merely a question of danger to the building itself and its occupants, but also to the lower buildings adjoining, and to those across the street, when the street is narrow, as is so often the case in the crowded parts of a city. This was proved in the case of the recent fire in Nassau street, when the two buildings on either side of the high structure were burnt out and those opposite were damaged and only saved with difficulty from sharing a similar fate.

Last Saturday the anniversary of Lincoln's birth was more generally observed throughout the country than ever before. Five States already mark the day by law as a public holiday, and it is likely that several others will follow suit before another year rolls round, even if Congress does not in the interval decree its general observance. More and more, as the years go by, does public opinion incline to elevate the memory of the martyr-President to the highest point of honor and reverence. As the figure of Abraham Lincoln recedes into history, the more heroic proportions does it assume and the larger the space it occupies—a true criterion of real greatness. His comparatively brief national career, embracing only eight or nine years, was yet long enough to cover the most critical period in the history of the nation to which he rendered such splendid services. A child of the people, reared in extreme rustic poverty, he climbed the hights of success by sheer force of character until he was chosen by the people to direct the destines of the republic from the highest

place in the nation. His single hearted patriotism, the unassuming modesty of his nature, his sterling honesty, his firmness and self control in the face of immense responsibility and danger, his sympathy with suffering, his passion for justice and his hatred of wrong, his broad charity and thorough humanity, combined with his unexampled common sense, conspired to make Lincoln the highest type of a man and the most complete embodiment of true Americanism. This it is which will ever keep his fame pre-eminent.

Champion Black Diamond Blacksmiths' Self Feed Post Drill.

The accompanying engraving shows the new blacksmiths' drill which the Champion Blower & Forge Company, Lancaster, Pa., are putting on the market. The



Champion Black Diamond Blacksmiths' Self Feed Post Drill

makers state that the illustration shows the construction of the drill to be new in principle and to possess merits. The gearing is designed for easy and quick running, being compounded for the increasing of power. The side fly wheel in connection with the top fly wheel is claimed to be a very practical feature when it is considered that both fly wheels make two revolutions to one revolution of the crank. The second speed, for heavy drilling, is very convenient, and instantly changeable, the change being effected by transferring the crank handle to the side fly wheel. The makers state that the machine embodies the best of material and workmanship, with all bearings ground from solid metal, and that it appeals to all persons wishing a perfect drill and yet unwilling to go to the expense of a cut gear drill. The machine drills to the center of an 18-inch circle, and unless otherwise ordered is furnished with a spindle bored to take in ½-inch shank drills. It drills from 0 to 1½-inch hole, and its weight is 200 pounds. It is furnished for use with power when required.

Felt Mats for Rails.

Engineers and railway men are much interested in the results of tests now being made abroad with mats of felt, which are designed for laying under the rails of street railway lines for purposes of protection and sound deadening. The new mat, which is a German invention, was first exhibited at Leipsic last summer and attracted considerable attention. It is described as made of strong wool, which is thoroughly impregnated with oils, then superficially coated with glue which has been rendered insoluble by the addition of sodium bichromate and formaldehyde, and then very highly compressed to form plates from ⅛ inch to several inches in thickness and of various sizes. They are especially recommended for crossings and bridges, but are desirable for use all along the track, and it is claimed that they tend to prolong the life of the rail by lessening the wear on it. The surface of the mat is said to be so hard that a rail may be placed upon such a piece of matting without cutting into it. In addition the claim is made that by placing the mats under the bed plates, bearings between the joists and other such places in the engine rooms, the noises therein will be reduced to a minimum. The material is known by the name of iron felt. The main question is as to how long the mat will retain its elasticity. Another recommendation for the preparation is that it prevents rotting.

At the annual meeting of the Boston Electrical Club, held last week, a novel feature was introduced in the form of a long distance telephone entertainment. A telephone receiver was placed at the side of each of the 70 members of the club who sat down to the banquet and suspended from the central chandelier was a megaphone. During the evening a number of professional entertainers in New York transmitted songs and humorous talks through the telephone for the delectation of the Boston electricians, and President Chandler of the Postal Telegraph Cable Company, sitting in his library in Brooklyn, N. Y., delivered an address to the diners in Boston. Several other long distance speeches were also made. This plan would give an excellent opportunity for the multiplication of the *post-prandial* oratory of such famous speakers as Chauncey M. Depew, whose services, it is understood, are in such general request for festive occasions that he is forced to decline an enormous number of dinner invitations. By the aid of the long distance 'phone, the genial Doctor, from his library in New York, might charm the ears of thousands of diners with his wit and wisdom at one and the same time, thus saving time, labor and the undue strain on the digestive organs which a steady course of banquets must entail.

James Cooper, who has been an employee of the American Tube & Iron Company, Youngstown, Ohio, ever since they were started, recently patented a furnace for garbage disposal and has put in a bid to furnish Youngstown with one of the plants. Mr. Cooper has severed his connection with the American Tube & Iron Company to give his entire attention to the garbage furnace. As an indication of the high regard which was felt for him by his fellow employees they presented him at leaving with an elegant writing desk.

Mayor Harrison of Chicago has issued notice to the telegraph and telephone companies in that city that some 4000 overhead wires in the downtown district will be cut down by the city unless steps are taken to place them underground before March 1. The recent storms have proved that these wires are dangerous to life in the crowded business districts of a city. A number of broken wires falling across the trolley wires in Chicago and other cities have caused the death of several horses. In case of fire, the firemen also have to face a danger in consequence of the overhead wires. Mayor Harrison is determined so far as practicable to bury every wire in the city, and so do away with as much of the danger as possible.

F. K. Glidden, president of the Glidden Varnish Company, Cleveland, Ohio, sailed with his family on the steamship "Normannia" February 12, for a three months' trip through Italy and the Orient.

Daniel L. Jones, one of the oldest residents of Williamsburg, Brooklyn, N. Y., died February 11 at his home in that city, aged 92 years. He was born in Wales, but came to this country in 1832. He was engaged in the manufacture of lamps and gas fixtures.

THE LETTER BOX.

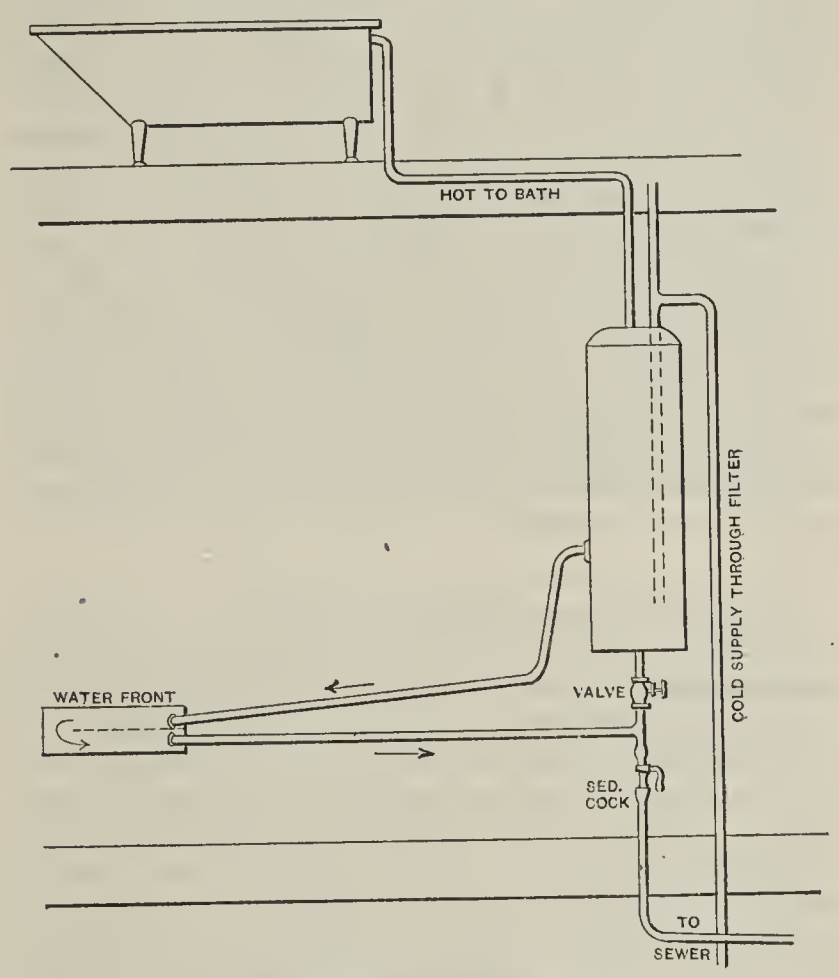
Computing Surface Exposed by Pipes.

From W., Milwaukee, Wis.—Please give me through *The Metal Worker* an easy method of finding the amount of heating surface exposed in 1 lineal foot of pipe ranging from 1 to 4 inches in diameter.

Answer.—The circumference of the pipe in inches should be multiplied by 12, the number of inches in 1 foot. This will give the number of square inches in 1 lineal foot, and for the smaller size by dividing the product into 144, the number of square inches in a square foot, the result will be the number of lineal feet that will be required to expose 1 square foot of surface. In larger pipes than 4 inches the product will need to be divided by 144. We give an instance of the method of calculation for 1-inch pipe. The actual circumference of 1 inch pipe is a fraction over 4 1-10 inches. This multiplied by 12 will give a fraction more than 49 square inches. Dividing 144 by 49 it is found that 2 9-10 lineal feet of 1-inch pipe will be required to expose 1 square foot of surface. The size of pipe is determined by internal diameter, and in the smaller size the thickness of the pipe varies very little from ⅛ inch. Adding the thickness of the two sides of the pipe to the internal diameter will give the total diameter. Multiplying the diameter by 3.1416 is a common method of arriving at the circumference. This laborious method of calculating the surface is, however, seldom used, for the reason that tables are printed by the manufacturers of wrought iron pipe, which can be secured on application, and these tables are also given in the catalogues of many of the dealers in plumbers' and steam fitters' supplies. A table giving this information and a great deal more in reference to pipes was printed in *The Metal Worker* of August 17, 1895. From that table we give the following information : To present 1 square foot of pipe 2 9-10 lineal feet of 1-inch pipe are required, 2 3-10 feet of 1¼-inch pipe, 2 feet of 1½-inch pipe, 1 6-10 feet of 2-inch pipe, 1 3-10 feet of 2½-inch pipe, 1 1-10 feet of 3-inch pipe, 1 foot of 3½-inch pipe and 7-12 foot of 4-inch pipe. This information is approximately correct for standard sizes of wrought iron pipe.

Trouble from RustyWater.

From Plumber, Pennsylvania.—We will be grateful for any assistance we may receive in locating the trouble we describe in connection with the sketch of a plumbing system presented herewith. We have a 30-gallon modern copper range boiler in a private residence in our town, and are troubled with discolored and apparently rusty hot water. The boiler is set about 5 feet from the range and is connected to the water front with brass circulating pipes and fittings, as shown. The water front is cast iron, and has been in use only four months. The water in the residence is filtered through a Hyatt filter which does its work beautifully, the water being clear as crystal when it enters the boiler, the filter being located in the basement, as shown. The water is carried to the boiler through ¾-inch galvanized iron pipe, and is delivered near the bottom of the boiler through a tinned copper tube. The water is carried from the boiler to the fixtures through ¾-inch galvanized iron pipe that has been in use since 1885. When the water is cold there is no discolored water from the hot water bibb, the discoloration increasing with the heat, being the worst when the water is hottest ; and then it is so bad that it is ruining a fine enameled bathtub, and the water is almost always extremely hot. In order to be sure of washing the boiler we have placed a stop cock between the boiler and the pipe leading to the water back and another cock below this pipe to serve as a regular sediment cock. By opening the sediment cock and closing the cock above it the water enters the water back through the pipe leading to the side opening in the boiler and passes through the water back, under the partition shown by the dotted line, and out through the sediment cock to the sewer. We have washed the boiler and water back as long as half an hour at a time to remove any accumulation of rust that might be located there.



Trouble from Rusty Water.

Note.—We shall be glad to have our readers who have had troubles of a similar character describe the remedies applied. We are inclined to the belief that the trouble comes entirely from the piping. The boiler could not

The Velocity of Hot Air Furnace Currents.

From J. C. C., Cleveland, Ohio.—We would be glad to learn through the valuable Letter Box of *The Metal Worker*, from the heating trade who are posted, the velocity with which air travels in a hot air furnace system under proper conditions. We assume that a hot air furnace is installed in a proper manner, amply large enough to heat the house in which it stands, with cold air box having an area equal to two-thirds of the entire area of all the hot air pipes running from the furnace. We would like to know at what velocity the air will travel on entering the cold air box in ordinary winter weather without any wind blowing. Also at what velocity the air will be discharged at the different registers under the same conditions. We would also be pleased to have the opinion of *The Metal Worker* on this subject.

Note.—We leave this question for our readers to answer, as we hope information will be furnished which is the result of actual test. There are many engaged in the heating business who have made such tests, and we hope that they will make a free use of *The Metal Worker* in relating their experience and commenting upon it. Our correspondent will find some information on the velocity of air currents in furnace heating systems in *The Metal Worker* Essays on House Heating.

produce rusty water and the method of flushing the water back would overcome any trouble from that source. It has been frequently reported that the galvanizing on pipes does not effectually protect them, and that in some instances the rust is sufficient to entirely fill up the pipe. When a house in which the piping is of galvanized iron is closed for a time and the pipes are left empty it is not uncommon for the first water that is drawn to be discolored from rust. In many instances after the pipes are washed clean no further trouble is experienced. The trouble from galvanized iron pipes rusting is the reason that many plumbers adhere exclusively to the use of lead service pipes. The age of the pipes in question leads to the opinion that the pipes are so corroded that the trouble will be difficult to overcome without replacing the pipes. It will be a simple matter to shut off the water and drain the system, then take out a section of pipe for examination. If badly corroded we would be glad to see a sample.

Laying Copper Valleys.

From W. Neubecker, New York City.—Replying to your correspondent "C.," Mansfield, Ohio, whose inquiries appear in *The Metal Worker* of February 5, would say that we are at present doing a repair job on St. John's Home in Brooklyn, N. Y., on which new copper valleys are being placed. I would advise him not to slide separate pieces under the slate, but to make a good job by removing the slates by means of the slate ripper, only removing as many as are required. Then lay in the copper valley as illustrated and described under the title of "Laying Copper Valleys," in the article on "Slate and Copper Roofing on Fire Proof Buildings," page 52, in *The Metal Worker* of December 4, 1897. The valleys should be of soft copper in 14 x 48 inch sheets, laying the slates close so as to show 2 inches of copper valley ; or in other words, let the slates lap the valleys 5 inches. In this manner we have done hundreds of repair jobs with good results.

From Pearl, Newton, Mass.—In reply to "C.," Mansfield, Ohio, in *The Metal Worker* of February 5, in reference to putting in new copper valleys, would say that I would take off the slate and put in valley flashings. If he undertakes to slide the flashings up underneath the slate, they will in time drop out and his job will go back on him. I think an open valley is the best—that is, take off the slate and line your valley with copper 14 or 16 inches wide. Then lay the slate back on the copper 4 inches on each side, leaving an open water course of copper down the center. This is the best way, but perhaps the owner or architect wants a closed valley.

From Jacob Hoover, 337 Reily Street, Harrisburg, Pa.—In reply to the inquiry of "C , " Mansfield, Ohio, in *The Metal Worker* of February 5, concerning laying copper valleys, I would advise him to make four valleys in one piece, say 16 feet long and wide enough to go up under the second course of slate. Have as few cross seams as possible, and solder them on both sides. If the valley is deep make it fit loose so it will have some room to give in cold or hot weather. Two cross bright tin soldered on both sides and a good coat of paint on both sides will make as good a valley as copper. I put one on a house here in Harrisburg 15 or 18 years ago, and it is in good condition yet. I will be very glad if Mr. "C." would let me hear from him.

Paper on a Metal Roof.

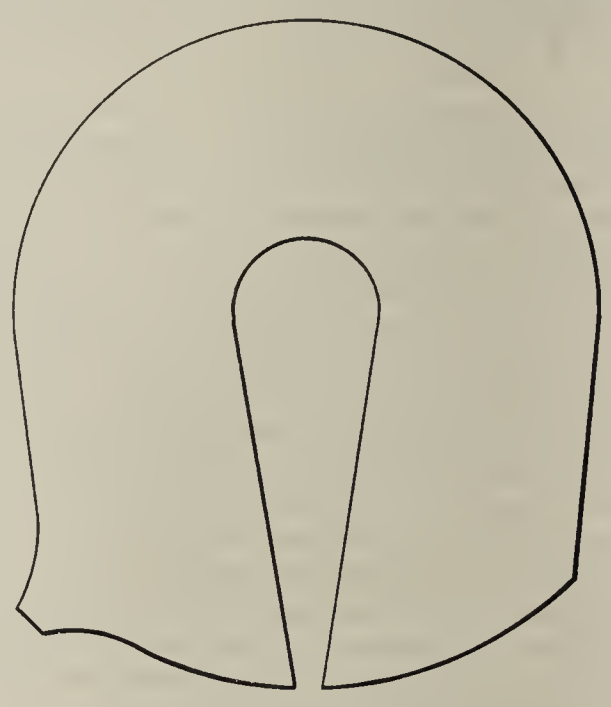
From X. Y. Z., Indiana.—Please tell me through the Letter Box what use paper is under a metal roof. Does it prevent the moisture from accumulating or does the paper absorb the moisture, and if so why will not this damp paper be injurious ?

Answer.—The idea of putting paper or any insulating material under a metal roof is not to absorb the moisture but to prevent the warm air inside of a room or building coming in contact with the cold metal, and thus condensing the moisture upon it. A covering of paper under neath a metal roof being a good non-conductor w main more nearly the temperature of the room than would the exposed metal, consequently the moisture will not be condensed. Our correspondent has often noticed, undoubtedly, the drops that form in summer time on the outside of an ice pitcher. If he will wrap a piece of flannel around that same pitcher he will find that no moisture is condensed, nor will the flannel be wetted.

How to Make a Horseshoe Magnet.

From R. T., Minnesota.—Please inform me through *The Metal Worker* how to make a horseshoe magnet. I desire to make one of special design, and would like to get it as powerful as possible for the size. I inclose a sketch of magnet desired.

Answer.—A permanent magnet of the horseshoe form, as drawn by our correspondent, should be made from a bar of good tool steel of the form like the drawing, and ½ inch think. If a thicker magnet is required, two or more magnets may be made, ¼, ⅜ or ½ inch thick, and drilled with three small holes through each piece to gauge, so as

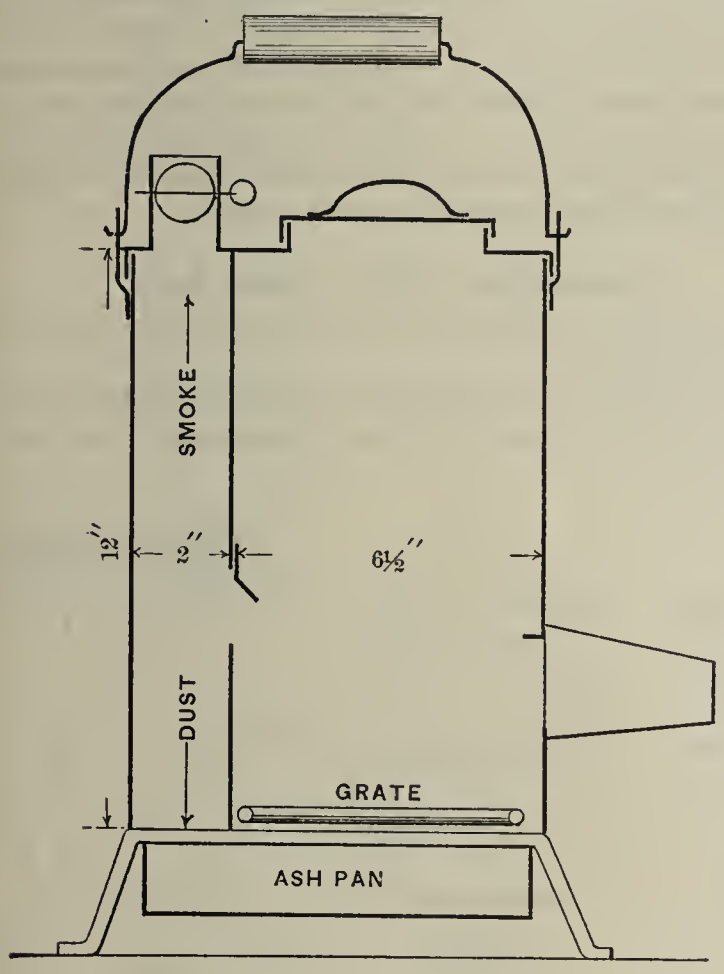


How to Make a Horseshoe Magnet.

to bolt or rivet them together. Great care should be taken in forging not to overheat the steel—a cherry red is the proper heat—nor should the steel be hammered when the red is fading. When the forging is finished it should be annealed by heating to a full red heat and covered with hot ashes of the fire to slowly cool. When finished and ready to harden, heat in a large charcoal fire, evenly to a full cherry red ; holding the forging in a tongs at the bend, plunge it vertically in a pail of water in which a pint of salt has been dissolved. Finish on a grindstone or by emery wheel or stick, and have the surface perfectly clean. Then heat a flat piece of cast iron to a dull red and slowly slide the piece on to the plate at the bend first, so that that part will become a little hotter than the ends of the magnet. When the ends have become of a light straw color, and the bend slightly deeper in color, plunge in cold water, dry and oil to prevent rust. For magnetizing the horseshoe you will need a strong magnet of a similar kind to use by contact, or use a strong pair of electromagnets in contact with the flat sides of the horseshoe at the ends. In the absence of magnets wrap the legs of the horseshoe with tough paper, then wrap a coil of insulated copper wire, beginning at the end of one of the legs, wrapping closely until the bend is reached, then cross to the opposite leg and wrap it in the opposite direction toward the end. The copper wire when placed in the lamp circuit of any electric lighting system will charge the magnet. An armature of soft iron should be fitted to the end of the magnet, which will strengthen the charge and keep the magnet strong afterwards. Any engineer of an electrical plant will advise as to details in charging the magnet.

Tinners' Fire Pot.

From Warwick, Peterboro, N. H.—In reply to the inquiry of "E. E. H." in *The Metal Worker* of January 22 for tinners' fire pot, I would say that perhaps the one I use will suit him. I made it nearly two years ago when time was cheap and money was dear, so instead of buying it made one like the accompanying sketch. Fig. 1 shows an elevation of the square fire pot which was 7 inches wide and 8 inches deep from front to the back, and the body of it was 12 inches high. Across the back part of the body, as shown in the plan in Fig. 2 and in the elevation, I ran a heavy sheet iron partition, the partition being made of No. 16 iron, while the other parts of the fire pot are made



Tinners' Fire Pot.—Fig. 1.—Sectional View.

of No. 24. I made a suitable opening at the front for the insertion of the soldering irons, and provided a sheet iron hearth for them to rest on and also to prevent the coals from falling out. In cutting the opening in the front for the coppers I cut it 1 inch narrower than I required and then increased the opening by bending this portion inward at the top, as shown in Fig. 1, to prevent the coals from falling out when the irons were withdrawn. I cut an opening 2 inches high and 4 inches wide in the partition at the back of the furnace and riveted above this opening

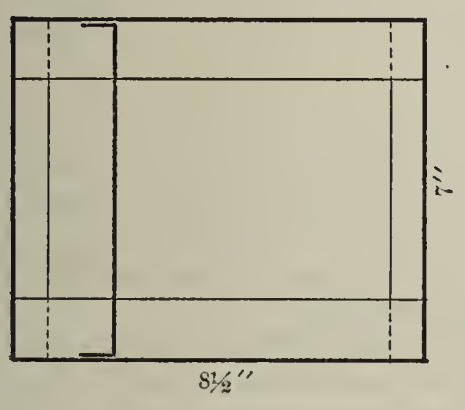


Fig. 2.—Plan at Grate.

a piece of sheet iron bent to an angle to prevent the partition warping inward from the heat. This heavy partition is fitted in very tight so that leakage cannot make the fire burn more freely than is desired. The opening in the partition is 5 inches above the grate. The opening for inserting the coppers is 2 inches above the grate. At the top of the furnace a round cover about 4 inches in diameter is provided for an opening for supplying charcoal to the fire. At the top of the 2-inch flue at the back of the furnace there is a 2-inch round pipe, so that the furnace can be connected with a flue if desired, and in the pipe is a damper so that the draft can be stopped when necessary. The bottom is constructed so that an ash pan slides in and out on ledges provided for the purpose. This ash

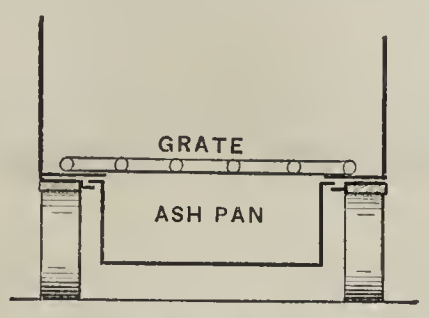


Fig. 3—Showing Method of Supporting Ash Pan.

pan is large enough to catch any dust that may drop down the flue at the rear of the stove. Fig. 3 shows the method of supporting the ash pan. Just above the ash pan a cast iron grate is provided to prevent the large coals from falling into the ash pan. I have found this stove very economical, and made it because I found that my gasoline stove did not heat my coppers, and as I was soldering copper work nearly all the time I found charcoal preferable. I also found that gasoline cost me 12 cents a gallon in the shop, while charcoal costs me but 14 cents a bushel. I can run my stove and get all the heat I want for one pair of 4 or 6 pound coppers cheaper on charcoal than on gasoline. I have used this stove a little on outside work, but as I do not do much outside I am not certain that it is large enough. It serves me well in the shop. The legs for the stove are made of band iron and riveted to the base.

Rating Furnace Capacity.

From O. S., Philadelphia.—Will *The Metal Worker* kindly inform me of a good and accurate way of finding the heating capacity of hot air furnaces for heating with hot air, the grate surface, dimensions of radiator, casings, &c., being known?

Note.—This is a subject which we will be glad to have discussed in *The Metal Worker*, and invite a free use of its columns for the purpose. In the meantime would refer our correspondent to the series of articles entitled "Rules for Proportioning Furnace Systems," which appeared in *The Metal Worker* March 13, March 27, April 17, April 24, May 1, and May 8, 1897.

Recent Examination of Plumbers.

From R. K., Oak Park, Ill.—I have read so much about the plumbers' examination at Milwaukee that I would like to know something of the cause of the failures. I have read about many helpers having passed examination, and some good plumbers failing to pass. The big percentage of failures also attracted my attention, and I would like to know the cause. Is it due to lack of education and knowledge of the theories or a want of mechanical skill and inability to wipe a 4-inch joint? What were the questions? If they could be published, I am sure it would interest many readers besides myself.

Note.—We do not know what questions were asked the Milwaukee plumbers, but if any of our readers can supply answers to these questions or give an account of the ground which they covered we should be very glad to have the information for publication in the columns of *The Metal Worker*.

Prof. Charles R. Richards, director of the Department of Science and Technology at the Pratt Institute, Brooklyn, which includes the trade and manual training schools of that institution, has been appointed to the chair of manual training in the Teachers' College of Columbia University, New York. Professor Richards was graduated from the Massachusetts Institute of Technology in 1885 and was connected with the New York Teachers' College before it became a department of Columbia University.

SHEET METAL WORK.

VARIOUS FORMS OF VENTILATORS.

BY W. N.

Various forms of ventilators which can be made by the sheet metal worker and do not interfere with the patented articles on the market are shown herewith. In Figs. 1 to 4 A A A indicate the braces. In Fig. 5 B is a half circular hood, riveted at C. In Figs. 6 to 10 are shown ventilators composed of elbows and tees and in Fig. 11 what is known as a revolving ventilator, in which A H H revolves on the pivot at E, while C and D are band iron braces riveted to the side of the pipe and through which the rod B passes, extending upward through the braces in the revolving cap at F and J, meeting the glass top E. A wing, A, is riveted to the top, as shown, while H H is cut out of the upper part and forms wings which catch the wind. In Fig. 12 is shown another form of revolving top. A is the revolving top, B the flaring portion to catch the wind, C D is the vertical rod, passing through the braces F, E and H and meeting the glass top J, which is kept in a horizontal position by the braces and metal K. The center rod on the top for the vents shown in Figs. 11 and 12 is filed as indicated at P in Fig. 12. In Fig. 13 is shown a form of ventilator with a closed top, B, and suction pipes at C, D and E. The wind blowing upward at E passes out at H and sucks out the air at F. The wind blowing downward, as at C, draws out the air, as shown by the arrow; no matter how the wind blows no down draft is experienced. In Fig. 14 A represents a section through a railroad car and shows the manner of applying ventilators to the transoms at B and C, an enlarged plan of which is shown in Fig. 15, in which S S represents a plan view of a transom window, in which a box shaped form is placed, made of sheet metal, flanging out on the inside of the car, as shown, having openings at E and D. A damper, C, is placed in this box with a pivot at P.

Now, when the car is going at speed in the direction of the arrow A the wind striking against the damper C, in the direction of the arrow B, closes the damper and keeps the wind from blowing into the car, but leaves the rear of the box at D open. The speed of the train causes a suction, which draws the foul air out of the car, as shown by the arrow D. Should, however, the train go in the opposite direction the damper will close, as indicated by the dotted line, causing the same results.

Tinsmithing Fifty Years Ago.

We have the following letter from John S. Brooks of Brooklyn, N. Y.:

Your Western correspondent, whose letter was in *The Metal Worker* February 12 about tinsmithing 50 years ago, wished to hear from others on that subject. The writer began tinsmith work at Rochester, N. Y., 53 years ago, and the men who worked in assortment shops made the same number of articles mentioned for a day's work at 75 cents per day's work so-called, and did about ten days' work each week. They were obliged to work lively to do that and most of them preferred stated wages of about $7.50 per week. We often got the boss to give us six dozen milk pans or some other lay out and would get through at 4 p.m., but could not keep up so fast through a week, and wanted also to get outdoors for a change, even at roofing or any hard work. Those days are past, never to return. The department store has made the prosperity of the modern tin factory, where a machine for producing the wire ring to hang up a dipper costs more than an entire outfit of the old tin shop. I saw the first circular shears and the double seaming machine, and

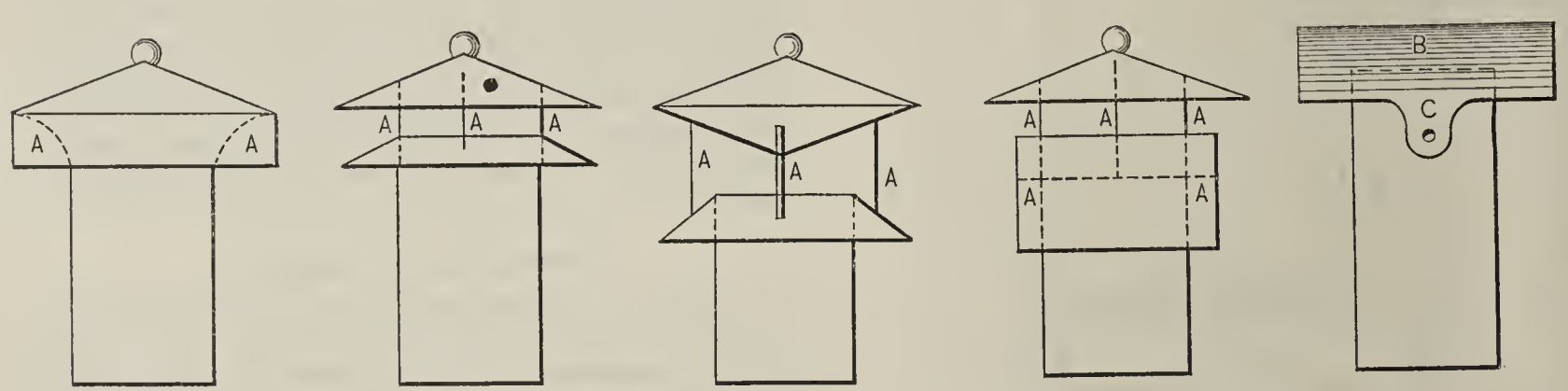


Fig. 1. *Fig.* 2. *Fig.* 3. *Fig.* 4. *Fig.* 5.

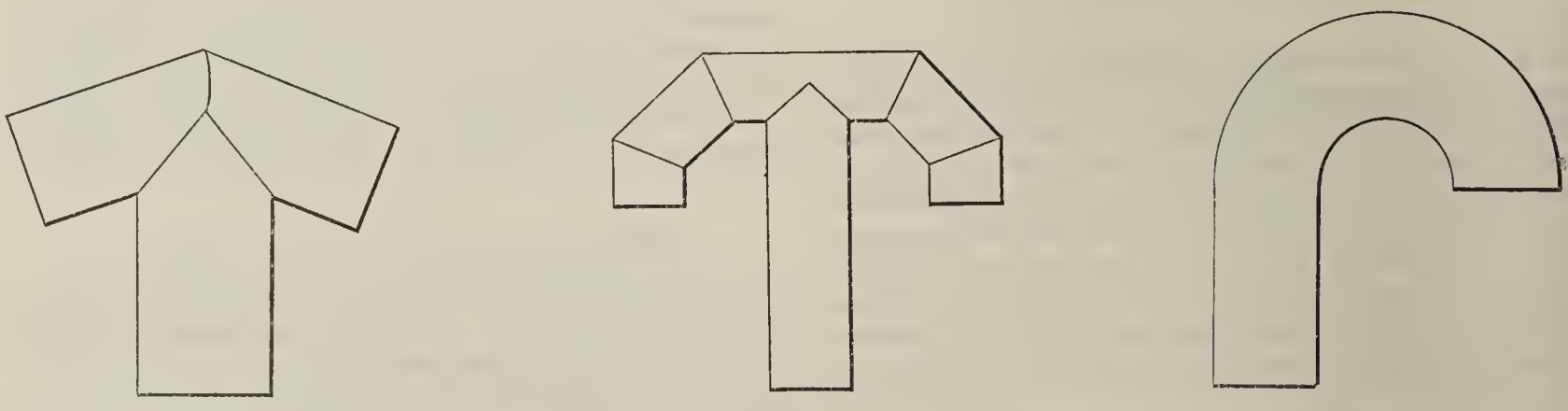


Fig. 6. *Fig.* 7. *Fig.* 8.

VARIOUS FORMS OF VENTILATORS.

it is a fact that very little change has been made in the old set of tinners' machines and tools from that time to this, and many shops now do not have them all, as in 1850. The workmen of that day were very superior intellectually to those of to day, who turn out four times the quantity by machinery. In a visit to Rochester lately I found that I am the only man living out of the ten who made up the firm and workmen of my old shop, and yet I am able to do a fair day's work in any emergency at the age of 68, but I do it without the drawback of stimulants.

Metal Sheathing for Passenger Cars.

At the last meeting of the Master Car Builders' Association, Mr. Appleyard described a passenger car on the New York, New Haven & Hartford, the exterior of which was finished with sheet copper instead of the usual finish of paint and varnish. No paint or varnish was used on the outside of the car body excepting on the roof, platforms, hoods and window sash. This car was put in service January 18, 1897, between New York and Boston, and Mr. Appleyard now advises us that the new finish has given satisfactory results, and that after a year in service the car has quite as good an appearance as when it first left the shop. The *Railroad Gazette* reports that a coach on the same road is now being covered with aluminum bronze and a third with sheet aluminum. The aluminum bronze finish will weigh practically the same as the copper, while the weight of the aluminum will be about one-third that of the copper finish. It is expected, however, that the aluminum covered car will cost more than would a similar car newly painted and varnished, but the difference in cost will be quite small.

The new method consists of covering each piece of wood sheathing, paneling, belt rails, letter boards, &c., with the sheet metal before applying the parts to the car, so that the metal fits tightly the wooden pieces. The sheathing is plated by means of a simple arrangement of rolls. Each piece of sheathing and its corresponding piece of metal is passed through the machine together and comes out ready for use, the metal fitting the tongue and extending into the groove at the sides. The sheathing is applied to the car in the usual manner, the grooved side being driven over the tongue and nailed so that the fastenings do not appear on the surface. The metal surface is not punctured in any place by the fastenings, and all joints are water tight. The numbers and letters on such cars are made of cast brass or aluminum as desired.

As previously stated, the first car turned out was covered with copper, and the cost of this car was about $50 more than it would have been had paint and varnish been used, but its cost was considerably increased because the process was new and the work was done slowly. It is stated that it requires from 800 to 900 pounds of copper to finish an ordinary passenger car, and that the first cost of metal plating cars need not exceed the cost of painting.

A saving can be made by using a less expensive grade of lumber with the metal finish than can be used under paint and varnish, and also with the new process the cars are less time in the shop. Where it requires 28 days to finish a coach under the usual system, the same work can be done by means of the metal plating in 18 days. There is an additional feature of the new system, in that it is not necessary to shift cars from one shop to another, but all the work can be done with the car in one place, thus saving the cost of moving the car in the shops. It has also been found that it costs less for cleaning metal covered cars in the yards than those finished with paint and varnish, while the appearance of the metal is not affected by service, as is the case with painted surfaces.

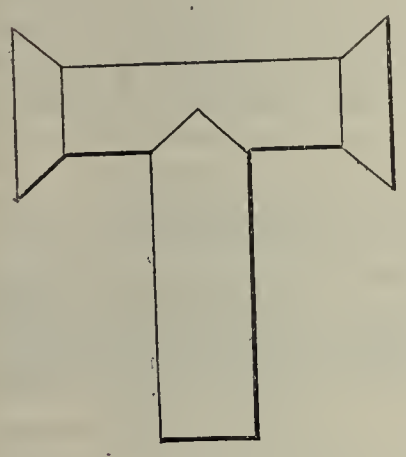


Fig. 9.

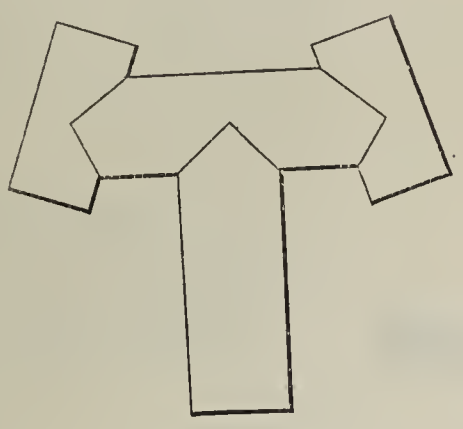


Fig. 10.

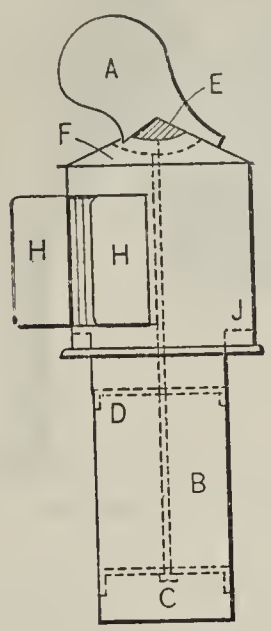


Fig. 11.

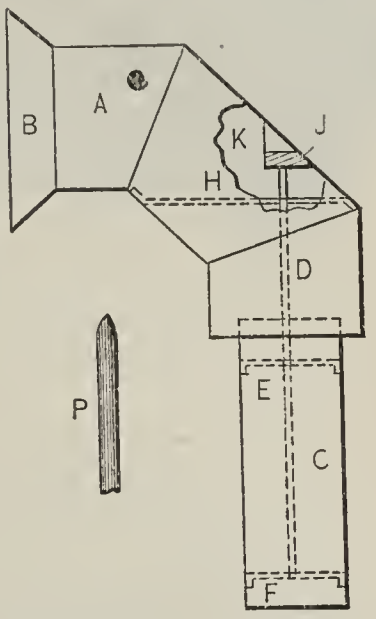


Fig. 12.

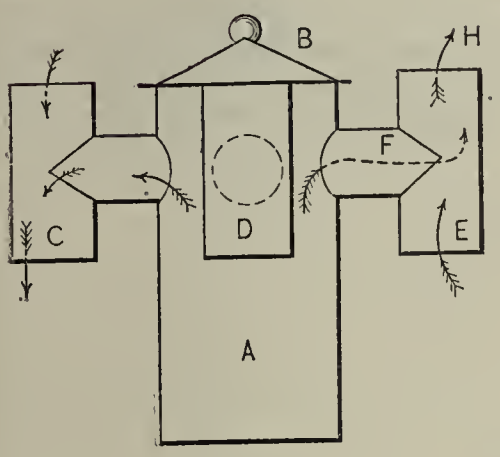


Fig. 13.

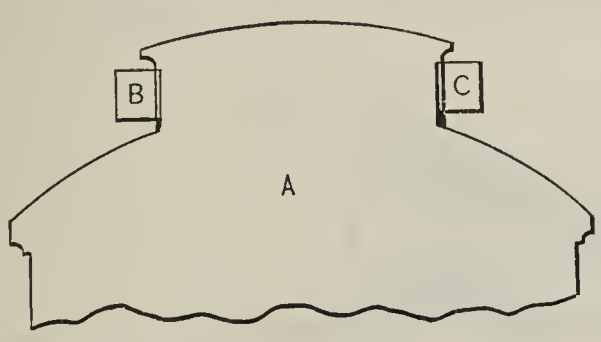


Fig. 14.

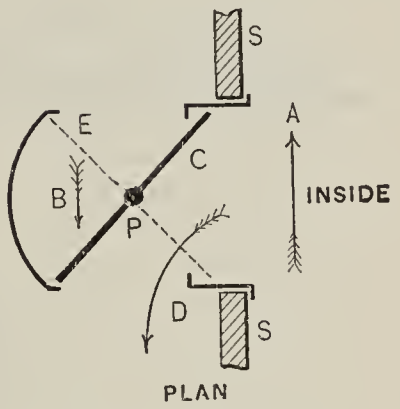


Fig. 15.

VARIOUS FORMS OF VENTILATORS.

FLASHINGS.

Advices from Chili report an active and increasing demand in that country for Corrugated Iron. It is quite likely, according to local merchants, that some purchases in this line may be made in this country, although the British prices still rule considerably lower than those of the American manufacturers of Corrugated Iron.

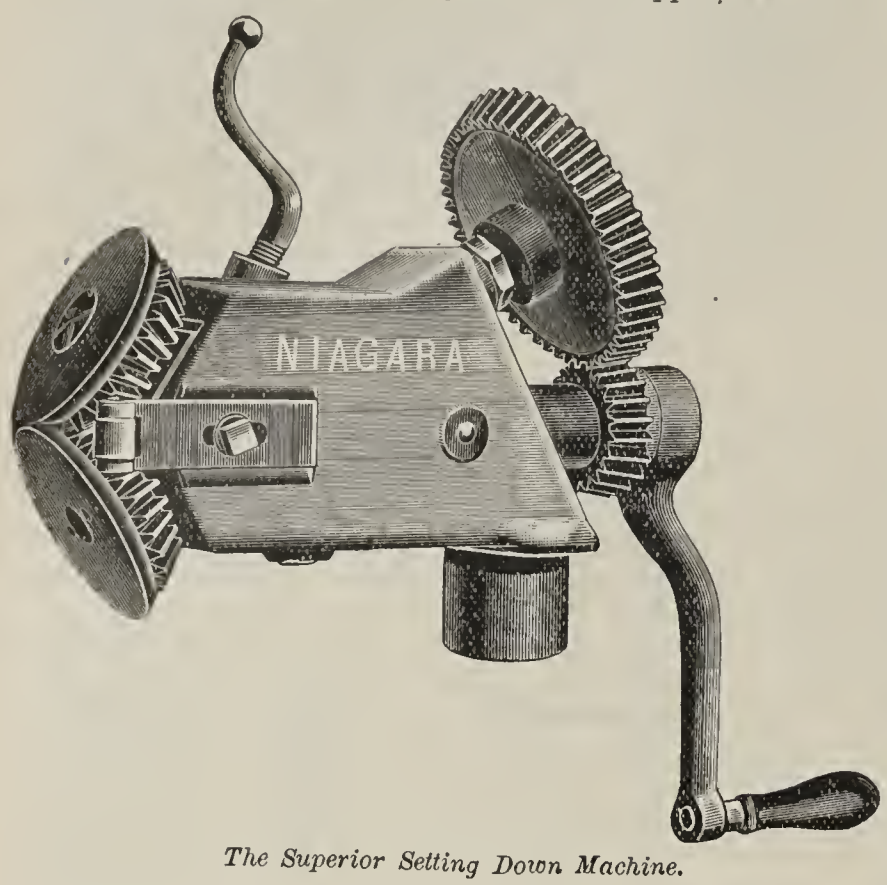
The calendar issued by the Sykes Iron & Steel Roofing Company, Chicago, Ill., and Niles, Ohio, in the interests of their business is decorated with an exceptionally handsome picture in colors, showing the head of a Florentine girl. An unusually rich effect is produced and gives to the calendar more value than usually attaches to publications of this sort.

English trade papers refer to the demand for Corrugated Galvanized Sheets in New Zealand as being extraordinarily active.

The Newark Cornice & Skylight Works, Newark, N. J., have been incorporated with a capital stock of $12,000.

The Superior Setting Down Machine.

The Niagara Stamping & Tool Company of Buffalo, N. Y., are introducing a setting down machine which is intended particularly for heavy work up to 20 gauge. The handle is attached to a shaft carrying a bevel pinion, which engages a large bevel gear mounted upon an inclined shaft. Through this shaft motion is transmitted to the lower face, which is geared to the upper face. The

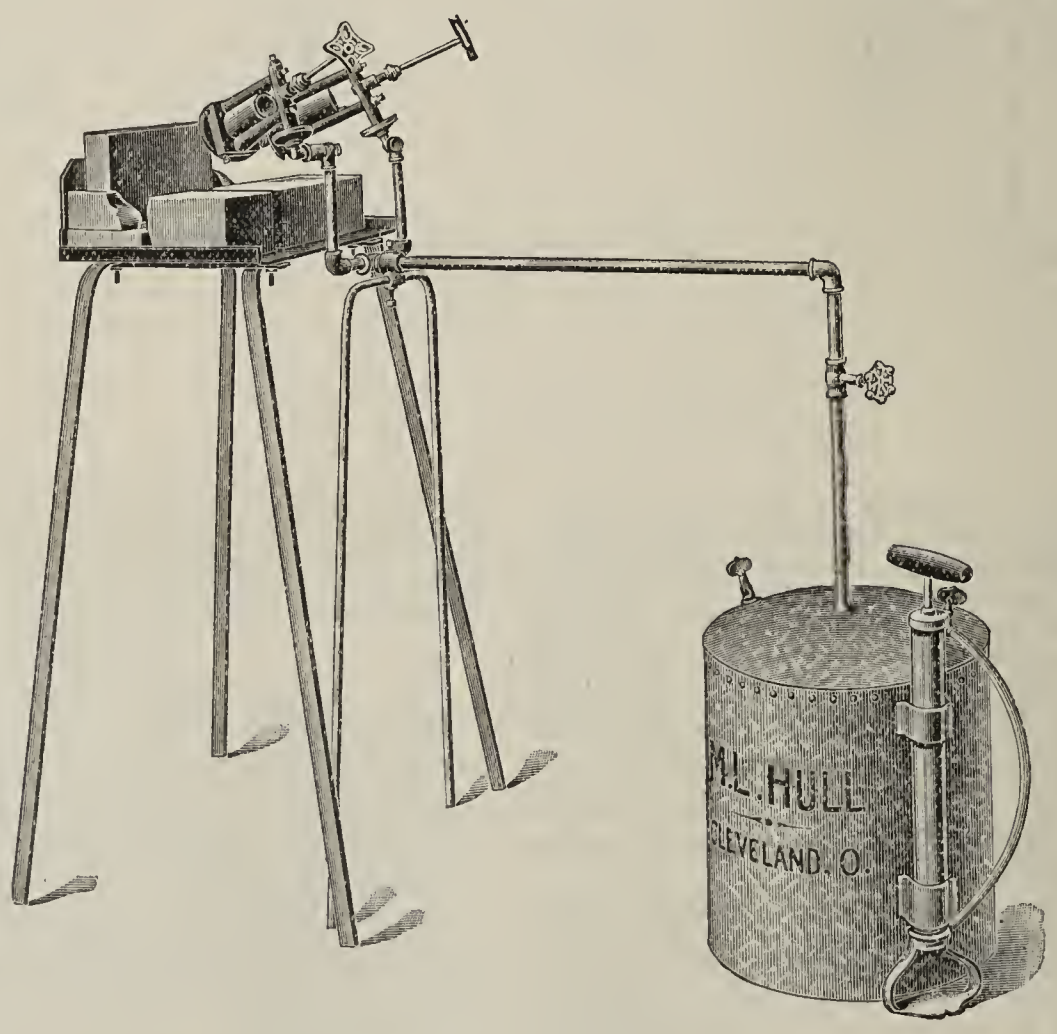


The Superior Setting Down Machine.

inclined position of the faces permits tipping the work and thereby bending the seam toward the body. This presents a decided advantage in the succeeding operation of double seaming. On both sides of the frame there are adjustable gauges which can be set for seams up to ½ inch wide.

Hull's Improved Brazing Furnace.

The accompanying illustration shows a brazing furnace put on the market by M. L. Hull, Cleveland, Ohio, for which many special features are claimed. In the first place the burner is described as exceptionally powerful, being the same as is used on Hull's assayer's furnace for melting gold and silver. Every burner is furnished with a swivel joint to throw the flame up or down or at any angle. There is also provision made for a side movement to the right and left, thus giving the operator every facility. One burner is said to be sufficient for any ordinary repair shop, though where new work is to be done it is pointed out that two burners will accomplish the object more rapidly. These brazing furnaces can be furnished with one or two burners, as may be desired. A special feature is having the hearth, frame, burners and tank separate. The tank provided holds 5 gallons, tested for strength, and has a 12-inch pump attached. Mr. Hull will furnish this device, leaving the buyer to provide his own frame and hearth if he choses to purchase that way, though he can furnish the whole thing complete. The brick hearth, as illustrated, is formed to leave a pocket in the center for coke, though the burners are said to be so powerful that the manufacturer does not think the use of coke necessary.



Hull's Improved Brazing Furnace

A Large Electric Power House in New York.—Negotiations were completed last week between the Metropolitan Street Railway Company of New York and the General Electric Company for the installation of a $610,000 electric plant. The plant is to be installed in the new power house which the Metropolitan company are erecting at the foot of East Ninety-sixth street and East River, New York. There will be other contracts to follow the one awarded last week, as the traction authorities propose to eventually be able to produce 70,000 horse-power. The contract awarded the General Electric Company includes five 5000 horse-power dynamos. The installation of these alone will make the plant the largest of its kind, constructed for traction purposes, in the world. The new power house will occupy a space of 201 x 279 feet. About one-half of the building will be given up to the coal bin, boilers and conveying machinery. There will be 87 boilers arranged in three tiers, each having a capacity of 400 horse-power. There will be 11 engines of 4000 nominal horse-power, but having a maximum capacity of 6600 horse-power each. The generators, one of which will be connected direct to each engine, will be of the three-phase, 6000 volt alternating current type. President Vreeland of the Metropolitan Company states that bids had been received and accepted for only a part of the equipment.

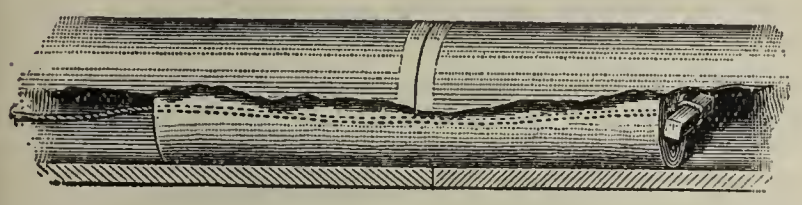
The first official estimate of the population of the new City of New York has just been completed by the city Health Board It gives a total of 3,438,899 inhabitants, of whom 1,911,755 live in the borough of Manhattan, 1,197,100 in Brooklyn and the remainder in the boroughs of the Bronx, Queens and Richmond. This gives New York about 1,000,000 larger population than Paris, and makes it easily the second city in the world in point of population. Latest statistics give the city of London about 2,000,000 more inhabitants than New York.

HEATING AND PLUMBING.

SOME PLUMBING WRINKLES.

BY R. T.

Neatness in plumbing work is coming more into demand, particularly in lead work. owing to the comparison made by the general public with the nickel plated work that is used in many instances. This forces the plumber to add to his waste pipes, flush pipes and traps by burning on the necessary piece of pipe instead of lengthening the pipe by wiping a joint at the point of connection. This burning is a comparatively simple thing to do when the workman understands how to do it. Some prepare



Some Plumbing Wrinkles.—Fig. 1.—*Lengthening a Waste Pipe by Burning the Joint.*

the pipe by slipping one end into the other, the same as though the joint was to be wiped.

When I burn two pieces of lead together with an iron or soldering copper I prefer, however, to leave both ends square and butt them, having the ends perfectly clean and square and then cleaning the surface of the pipe all the way around about ¼ inch back from the end. After preparing the pipes I place them on a board so that they will lie in a straight line, as shown in Fig. 1. I then endeavor to get a piece of building felt or other heavy paper, and roll it up into a cylinder of just about the diameter of the bore of the pipe. This I insert in the ends of the pipe and bring the ends together. In order to get this paper out of the pipe I cut a piece of wood a little shorter than the diameter, tie a string to it and pass the string through the paper and on through the pipe to the end, so that when the burning is completed it is a simple matter to pull on the string and remove the paper cylinder. This paper cylinder serves to preserve the bore of the pipe in case of the iron being too hot and melting clear through. This, however, need never occur if the work is carefully done.

In order to have a sufficient thickness of lead at the point of burning, I take another piece of pipe or waste and cut it into a strip about ¼ inch wide and clean it bright on all four sides, then give it a coat of clean grease to prevent oxidation and also to serve as a flux. The soldering iron to be used for the work I do not tin with solder, but endeavor to face it with a coating of lead, filing the copper clean and coating it by rubbing it on a brick on which I have previously placed a sprinkling of rosin and of good sharp sand and a sufficient quantity of lead. The sand on the brick has the effect of filing and cleaning the surface so that the lead will adhere, the rosin acting as a flux. Then with the lead strip in one hand and the copper in the other I apply it to the joint, and with the heated iron melt a drop from the strip into the joint of the pipe, holding the iron until the drop and the pipe are thoroughly melted and united at one place. I then turn the pipe over and tack it by the same operation just opposite the first tack. After this is done it is a simple matter to continue on around the pipe. After having burned the pipe together I add more lead to the pipe at the joint by melting it on and fusing it thoroughly with the lead of the pipe. After a sufficient thickness has been provided it is a simple matter to rasp the pipe down to the proper size and scour it with a piece of sandpaper and polish with a piece of felt, so that it is difficult to tell where the joint is made.

In burning I use powdered rosin as a flux, and in order to prevent my fingers becoming gummed with the rosin I constructed a rosin box as shown in Fig. 2, which is made of a trap screw and a piece of tin. The rosin box is about 1½ inches in diameter and 6 inches in length. A ferrule for a trap screw is soldered into one end. The other end is made cone shaped, tapering from the size of the rosin box about 1½ inches back from the outlet to a hole about 3-16 inch in diameter. The cone is soldered to the cylinder forming the box. When completed it is an easy matter to remove the trap screw and fill the cylinder with pulverized rosin. Then in case of tinning fittings or burning on a piece of pipe as described, it is easy to take up the rosin box and deposit rosin at the desired point without waste and without soiling the hands.

In tinning nipples and all of my brass work, instead of tinning it only a sufficient distance back to enable a joint to be wiped I have found it a good policy to tin the nipple clear back to the shoulder. In this way any little sand hole that may be in the fitting is effectually closed, and in many instances I have been saved the work and the customer the expense of removing a defective piece. Like all plumbers I prefer to do lead pipe work, but all in the trade know that iron pipe is being used largely for house service, and with the desire to leave the work so that it can be readily repaired in case of necessity I place unions at such points as will allow parts of the service system to be readily taken down. In supporting pipes I use a pipe hanger which is somewhat more expensive than some are willing to use, but in the course of a few years the saving that will be effected should repairs be necessary will offset the first cost, and if this is explained the customer usually will not object. My pipe hangers are made so that the part which holds the pipe is in two pieces and connected by means of set screws. By the use of unions and this form of hanger a portion of a pipe system can easily be taken down so as to insert a tee for a new branch or to make any repairs that may be desired. By the use of this pipe hanger it is a simple matter to have the pipes

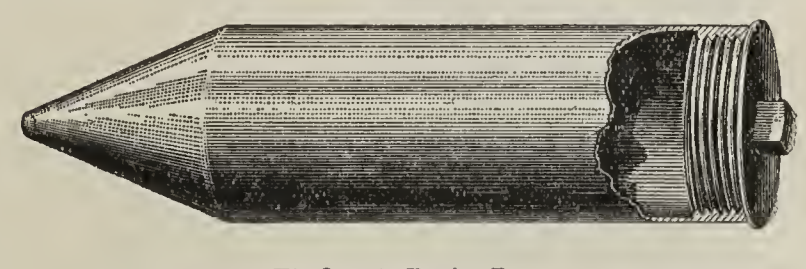


Fig 2.—*A Rosin Box*

perfectly aligned, and they present a much better appearance when in position.

Galvanized iron pipe will become more or less soiled and disfigured, however careful the workman may be in handling and working it, and in order to leave this pipe presenting an appearance equally attractive with the work of the painter or carpenter I have made it a point to give all pipes and hangers, fittings and unions a coat of aluminum bronze. When iron pipe work is done this way it looks as well as a lead pipe job which has been scoured with water and clean white sand or with sandpaper, polished with felt, and all the joints and fittings resoiled and finally covered with a coat of white varnish. To scour pipes and varnish them takes considerable time and labor, and instead of doing it I have in many instances resoiled the fittings and joints and then applied a coat of the silver or aluminum bronze to the lead pipe, much to the satisfaction of my customers.

CONNECTICUT MASTER PLUMBERS.

The eighth annual convention of the Connecticut State Association of Master Plumbers was held in the hall of the Young Men's Club, at New Haven, Conn., on Wednesday, February 16. The convention was called to order by the president, A. J. Clerkin, who appointed J. B. Beegan and J. F. Carr sergeants-at-arms.

S. E. Dibble, president of the New Haven Master Plumbers' Association, made an address welcoming the delegates and introduced the Mayor of the city, who confined his remarks to the benefit the public derived from the intelligent regulation of plumbing work that had been the aim of the plumbing trade, as he had noticed officially. Major Middlebrook then, with a few trite remarks, presented the Mayor with a badge on which was the plumbers' coat of arms—a pot, ladle and round iron. The president then appointed the following committees:

Credential.

E. Mahl, T. D. Barlow, F. A. Carlton, E. A. Creevy, F. A. Curtis.

Membership Committee.

L. D. Mills, J. A. Holland, J. M. Page, T. J. Reynolds, O. D. Sykes.

Auditing Committee.

Geo. S. Bull, A. B. Wilkinson, G. W. Utton, E. A. Kuhnly, F. F. Hitchcock.

Committee on Resolutions.

S. E. Dibble, C. S. Eames, James Ahern, L. H. Mills, J. B. Weiant.

The report of the Credential Committee showed the following members present:

LIST OF MEMBERS.

F. J. Reynolds, Ansonia.
Roberts & Arnold, Bristol.
L. H. Mills, Bridgeport.
H. B. Middlebrook, Bridgeport.
Wheeler & Cook, Bridgeport.
C. S. Eames, Bridgeport.
Green & Logan, Bridgeport.
E. A. Creevy, Bridgeport.
F. & F. C. Booth, Bridgeport.
J. W. Dunn Danielson, Bridgeport.
E. W. Peck, Derby.
C. R. Norman, Danbury.
W. E. Gaylord, Farmington.
Hector Chatman, Glastonbury.
James Ahern, Hartford.
George Mahl, Hartford.
Edward Mahl, Hartford.
James F. Duffy, Hartford.
Thomas Oakes, Hartford.
T. H. Langdon, Hartford.
M. Hogan, Hartford.
Lyon & Son, Hartford.
E. Lawler, Hartford.
Langdon & Daly, Hartford.
J. Mulligan, Hartford.
James Donovan, Middletown.
J. M. Page, Naugatuck.
J. B. Weiant, New Britain.
F. C. Weiant, New Britain.
F. W. Damon, New Britain.
P. J. Tormay, New Britain.
George Rappelye, New Britain.
S. E. Dibble, New Haven.
Clerkin T. McDonald, New Haven.
Rourke Bros., New Haven.
Robert Morgan, New Haven.
P. F. Connelly, New Haven.
John B. Beegan, New Haven.
G. W. Hazel, New Haven.
D. M. Sheehan, New Haven.
A. B. Wilkinson, New Haven.
Curtiss & Pierpont, New Haven.
F. A. Carlton, New Haven.
Robert Liddell, New Haven.
A. B. Sproul, New Haven.
J. A. Campbell, New Haven.
J. F. Clark, New Haven.
J. H. Buckley, New Haven.
J. F. Carr, New Haven.
P. F. Connelly, New Haven.
C. E. Coe, New Haven.
J. M. English, New Haven.
J. E. Igo, New Haven.
D. F. Kelly, New Haven.
Gay & Murray, New Haven.
Theordore Potter, New Haven.
T. L. Root, New Haven.
C. C. Bradley, New Haven.
William Brennan, New Haven.
John E. Igo, New Haven.
Henry H. Guernsey, New Haven.
M. J. Roach, New London.
J. D. Cronin, New London.
J. A. Holland, Norwich.
J. Troland, Norwich.
E. Ellsworth, Portland.
J. W. Fogarty, Ridgefield.
E. A. Kuhnly, Rockville.
H. R. Fay, Southington.
O. D. Sykes, Seymour.
W. F. Symonds, Unionville.
T. D. Barlow, Waterbury.
Disley & Weyand, Waterbury.
M. Clancy, Waterbury.
W. H. Clay, Waterbury.
George Durfee, Winsted.
C. R. Caton.
Wm. McMahan.
Menzies & Menzies.
T. H. Broderick.
M. J. Keegan.
Valentine Weidig.

T. D. Barlow reported for the Sanitary Committee that they had been most attentive to legislation, and recommended that every member assist in having a law enacted at the next session.

S. E. Dibble of the Legislative Committee reported that a plan of action had been devised to aid in securing a plumbing law and advised that literature to educate the public be distributed.

James Ahern of the Essay Committee read an essay on the influence of the association and the trend of its work in the future, which is printed in another column.

James F. Duffy of the Apprenticeship Committee suggested some changes in the report of the former committee and recommended that the report be incorporated into the by-laws, and on motion the recommendation was adopted.

S. E. Dibble then introduced to the convention the president of the Massachusetts State Association of Master Plumbers, T. J. Tute, who addressed the association on the troubles encountered by the plumber as a business man and the benefits derived from the association. He pointed out that to day the plumber was a fitter to fit up fixtures that were made by manufacturers, and that the inspector, who might never have seen or done a piece of plumbing work, but who was specially educated on the theory, was the man who bossed the plumber. The Southern League and its methods and success were explained, and he read a call for delegates to attend a meeting to form a New England League, to be held in Boston, March 10.

E. Mahl, national State vice president for the State of Connecticut, strongly supported Mr. Tute in a short address, urging the desirability of entering into a New England League and the need of more active work in bringing outside plumbers into the association. He urged that the plumbers work and contract only for the owner or architect, and not for a general contractor.

J. W. Green, Worcester, Mass., also spoke strongly in favor of the league movement.

President A. J. Clerkin then read his address, showing

an increase in membership and a prosperous condition of the association.

Winslow Zeliff, Newark, N. J., State vice president for New Jersey, was then introduced to the convention and made a brief address.

John Hickman, Paterson, N. J., member of the National Executive Committee, was introduced and made an address in favor of trade protection, and pointed out that co operation was the means of securing it.

Letters of congratulation and encouragement were read from T. P. Culloton, president of the National Association of Master Plumbers, and from Samuel L. Malcom, vice-president, and members of the Executive Committee.

The report of the treasurer, J. M. Donovan, showed a balance of $482.42 on hand.

A motion by E. Mahl was carried that the president appoint three delegates to attend the meeting in Boston to form a New England League. The president appointed E. Mahl, J. B. Weiant and L. H. Mills.

The convention then went into executive session.

After the executive session the following officers were elected:

President, J. S. Craig.
First Vice-President, F. J. Reynolds.
Second Vice President, Wm. H. Hazel.
Treasurer, James Donovan.
Recording and Corresponding Secretary, George S. Bull.
Financial Secretary, E. A. Creevy.
Executive Committee, J. S. Craig, F. J. Reynolds, W. H. Hazel, James Donovan, George S. Bull, E. A. Creevy and A. J. Clerkin.
Delegates to National Convention, L. H. Mills, E. A. Rourke and George Mahl.

Henry B. Gombers, secretary of the National Association of Steam and Hot Water Fitters, was introduced and outlined the benefits of organization in an interesting address.

E. Mahl invited the members to hold the next annual convention at Hartford, which on motion was accepted.

The convention then adjourned to a banquet served at the Tontine Hotel, where, after a fine *menu* was disposed of, a number of speakers entertained the guests.

THE TRADE.

The manufacturing houses represented were:

Peck Bros. & Co., New Haven, by W. J. Hubbard of Boston; A. J. Purdue, J. B. Hitchcock, C. H. Downes, S. D. Baker, R. S. Thompson, New Haven.

E. S. Wheeler & Co., New Haven, by Wm. E. Morgan, W. Hotchkiss, New Haven.

C. S. Mersick, New Haven, by Frank Hyde, J. Woodruff, New Haven.

F. N. Dubois, New York, by C. W. Frean.

Henry McShane Mfg. Company, New York, by C. Barth, R. H. Maguire, New York.

J. E. Gallagher & Co., New York, by George Steller, New York.

Alberene Stone Company, New York, by J. Stahl, Jr., New York.

The Care of Steam Heaters.

The boilers in private dwellings, for heating purposes, usually carry only from 2 to 5 pounds of steam, says the Hartford, Conn., *Times*, and unless there is carelessness there is no danger of an explosion. The city water pressure is about 30 pounds to the square inch. Two heating boilers exploded on January 30—one of them in New Britain and the other in Unionville. In the latter case it seems to be admitted that cold water was turned on when there was very little water in the boiler, and the boiler was very hot. Of course, in such condition the inflow of fresh water would be turned to steam in an instant and the pressure would rise at once to hundreds of pounds to the square inch—enough to explode any boiler ever made. Yet hundreds of boilers are "blown up" by that cause. The indicator shows low water in the boiler, and more water is hastily turned on, then away goes the boiler, tearing the house to pieces and usually destroying lives.

When the water in a steam boiler is out or very low, turn the grate of the furnace and put out the fire. Let the boiler become cool before any water is turned on.

Providence Master Plumbers.

The annual meeting and the election of officers of the Providence Association of Master Plumbers occurred February 11. Affairs relative to the trade and in the interest of sanitary plumbing were discussed.

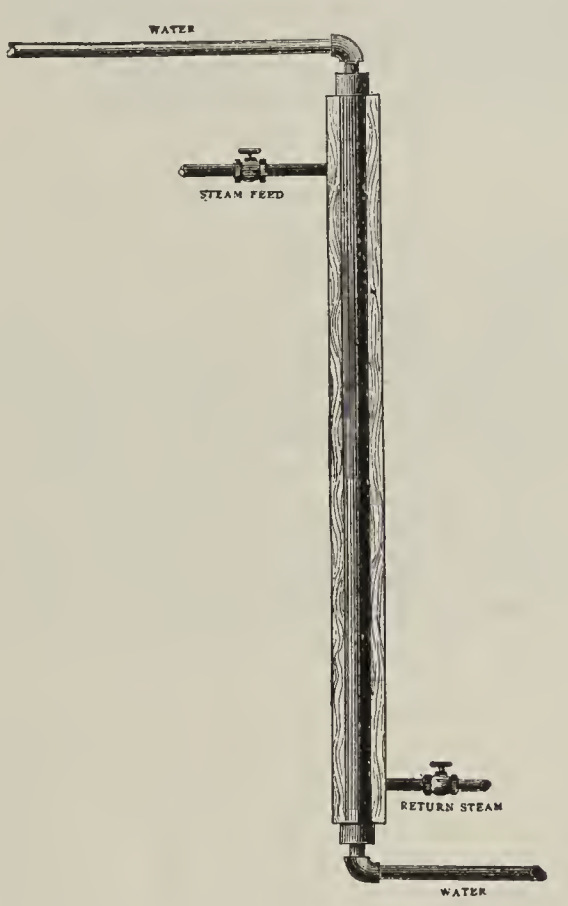
The officers elected for the ensuing year were:

President, Job S. Fuller.
First Vice-President, F. G. Lees.
Second Vice-President, John L. Carey.
Third Vice-President, P. Tierney.
Treasurer, J. B. Manchester.
Recording Secretary, C. P. Brennan.
Financial Secretary, T. G. Burlingame.
Corresponding Secretary, J. C. Conroy.
Sergeant-at Arms, P. O'Connor.

A Serviceable Water Heater.

Wherever a steam system is in use and warm water is desirable for washing or other purposes the water heater described by Walter Wiltshire, in the *Florists' Exchange*, for warming water for sprinkling flowers can be readily made and put in use:

The sketch of water heater shown herewith is a picture of one I have had in use for the past two winters,



A Serviceable Water Heater.

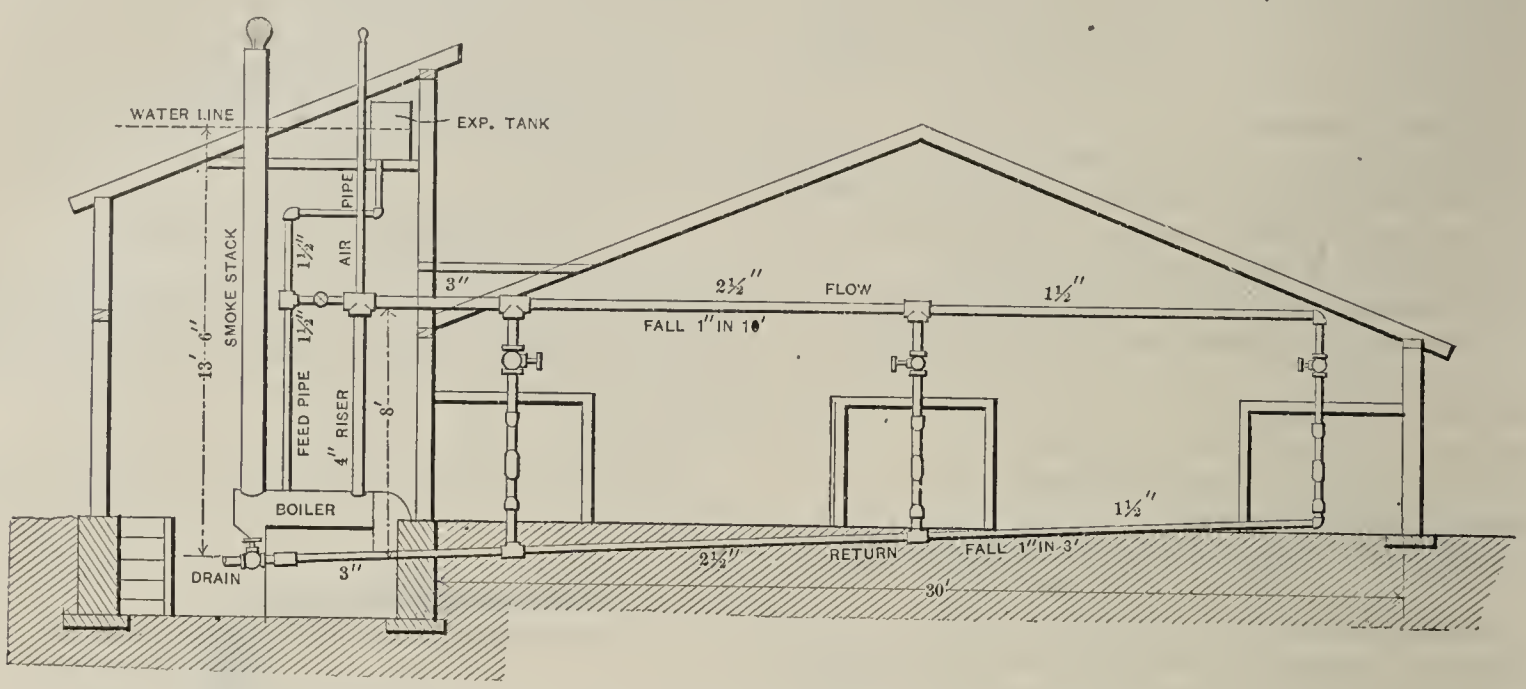
which for simplicity and effectiveness will be hard to beat. Any one who can handle steam fitting tools can put it up. It consists of a length of 4-inch pipe, with a length of 2-inch pipe passed through and connected with a cap at each end. A long thread is made on the 2-inch pipe, which allows the cap to be screwed on to the 4-inch pipe, at the same time providing sufficient length of 2 inch pipe through the caps to connect the water feed pipe. The water being supplied through a 1-inch pipe, it will be easily seen that the water will pass more slowly through the 2-inch pipe, and that's when it warms. The steam is turned on through a ¾-inch pipe conection at the top, and circulates around the 2-inch pipe, returning through the same sized outlet at the bottom.

With 5 pounds steam pressure the water will be heated from a temperature of 35 to one of 65 degrees, giving a continuous supply of warm water for syringing and watering. The cost is not high, the caps being the most expensive parts. If any trouble is experienced in getting the right castings they can be dispensed with and wooden plugs used instead. These answer very well, as the steam causes them to swell and prevents them blowing out, and they are also held in place by the 2 inch couplings.

Thomas E. Crone, manager of the New York office of the Model Heating Company, has moved into new quarters at 127 Worth street.

A Greenhouse Heating System.

A correspondent of *Carpentry and Building*, S. W. Douglass, Ashland, Pa., in a recent issue of that journal publishes an interesting communication relative to heating a greenhouse, his letter referring to previous articles that had appeared in *Carpentry and Building*. The greenhouse referred to is shown in elevation in Fig. 1, where the flow and return mains and branches are indicated, while Fig. 2 is a partial plan. The arrangement of the coils under the beds is shown in Fig. 3. The following extract from Mr. Douglass' communication explains



Greenhouse Heating System.—Fig. 1.—Elevation Showing Piping.

his method of calculating the amount of surface for this greenhouse:

The primary question for our consideration is the amount of heating surface necessary under certain conditions; one cannot guess at the amount necessary and say that 1 square foot will heat 40, 50 or 70 cubic feet of volume of a room or greenhouse like this. We are indebted to W. J. Baldwin for the best formula for working out the actual requirements under different conditions, based on the known amount of cooling effect of glass and wall surface per square foot, walls being taken at about one-tenth the cooling effect of glass. His formula has proven correct. By its use and the conditions presented by the San Jose greenhouse we get at a very close result that is applicable to any other greenhouse or room under similar conditions. Take as follows:

R—represents the amount of radiating surface necessary to counteract the cooling effect of the glass or wall surface.

T—The difference in temperature in degrees Farhenheit desired in the house and the external air.

t—The difference in temperature in degrees Fahrenheit between the temperature of the heating surface and that of the room or house.

g—The number of square feet of glass in the exposed walls with wall equivalent of glass surface.

The formula is $R = \frac{T}{t} g$, in which we have

$T = (60° - 40°) = 20°$. $t = (200° - 60°) = 140°$.

g = Glass roof, $32' \times 65' \times 0.9$ (of whole surface for glass) =	1,900 sq. ft.
Glass windows in side, 132×2	264 " "
Glass equivalent, 2 ends (wood work), $740 \times 1/10$	74 " "
Glass equivalent, 2 sides (wood work), $520 \times 1/10$	52 " "
	2,290 sq. ft.
Or say	2,300 sq. ft.

Then substituting in formula we have

$$R = \frac{20}{140} \times 2300 = 328.5 \text{ square feet}$$

of radiating surface necessary to overcome the cooling effect of the glass, to which ought to be added for that locality 20 per cent. for wind, cracks, holes, &c., and we have $328.5 + (328.5 \times 0.20) = 393\ 2$ square feet or, say, 400 square feet of radiating surface for the San Jose greenhouse.

The volume of this house is about 18,000 cubic feet. $\frac{18000}{400} = 45$, or 1 square foot of heating surface necessary to 45 cubic feet of volume. At zero weather just three times as much would be necessary, or 1 square foot would heat about 15 cubic feet of volume of room. In this locality we are apt to get 15 degrees below zero. We place the San Jose greenhouse under these conditions and substituting in the formula we have $R = \frac{60 + 15}{200 - 60°} \times 2300 = 1775$ square feet of radiating surface necessary, to which must be added at least 20 per cent. for windage, cracks, holes, &c.

$1775 + (1775 \times 0.20) = 2130$; $18{,}000 \div 2130 = 8.4$ cubic feet.

So that 1 square foot of heating surface would only heat 8.4 cubic feet of volume of greenhouse in 15 degrees below zero weather. I may then give for "rule of

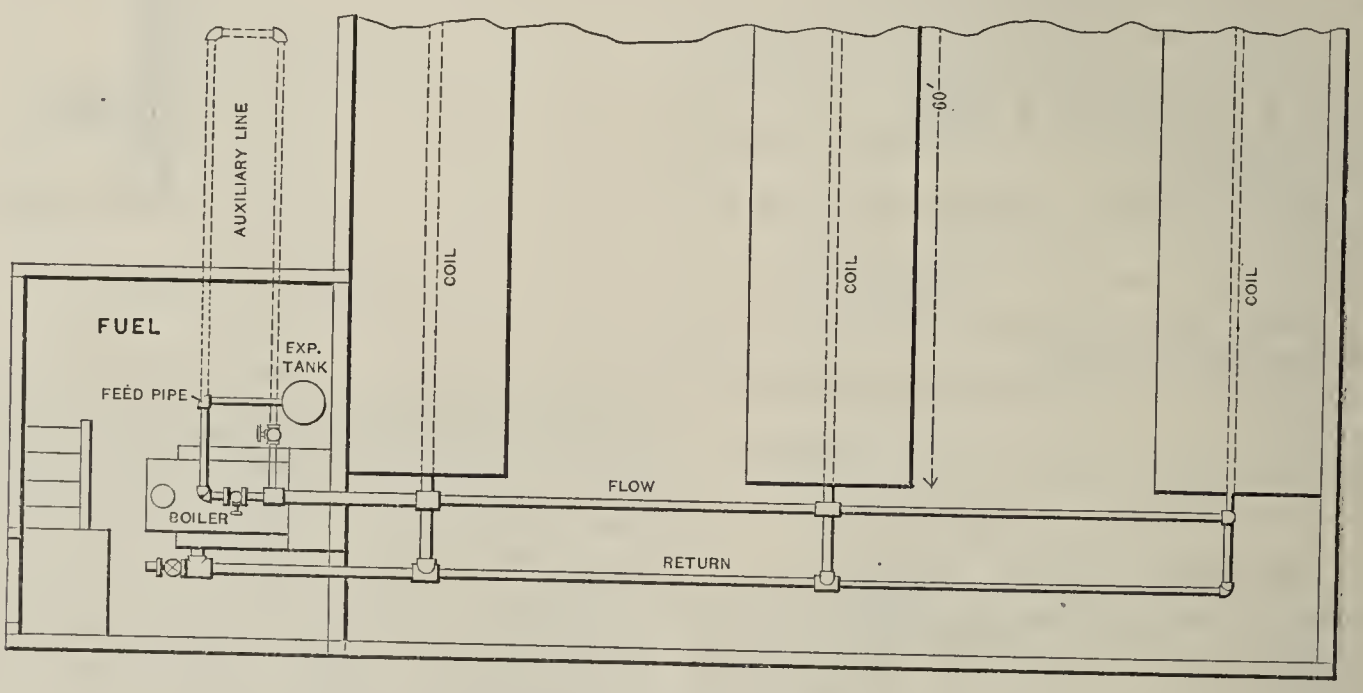


Fig. 2.—Partial Plan, Showing System of Piping.

thumb" for greenhouses with all glass roofs, built as this one:

House to be at 60°, external temperature 40°, 1 square foot for 45 cubic feet of vol.
House to be at 60°, external temperature zero, 1 square foot for cubic feet of vol.
House to be at 60°, external temperature 15°, 1 square foot for 8.4 cubic feet of vol.

Having found for the case under consideration that 400 square feet of heating surface was necessary, we next proportion the size of our pipe to maintain a uniform rate of velocity of flow, and I would caution the builder in the use of manifolds, as they divide up the flow, causing more friction, and the branches will never maintain the same velocity. Using manifolds also requires larger mains. Manifolds are all right for steam heat, but for hot water use coils. Place under each bed a coil of 1½-inch pipe, the internal area of which is 2.03 square inches.

3 coils, 4 1½-inch pipes 62 feet long, 744 feet; 2 feet to a square foot of external heating surface.....	744 ÷ 2 =	372 sq. ft. heating surface.
Drops, 1, 3 feet, 1, 3 feet 6 inches, 1, 3 feet 9 inches, of 1½ pipe = 10 3	÷ 2 =	5 sq. ft. heating surface.
Flow and returns each 12.3 feet = 24.6 feet 1½ pipe.....	÷ 2 =	12 sq. ft. heating surface.
Flow and returns each 12.3 feet = 24.6 feet 2½ pipe.....	÷ 1.3 =	19 sq. ft. heating surface.
Flow and returns each 2 feet = 4 feet 3-inch pipe.....	÷ 1.03 =	4 sq. ft. heating surface.
		412 sq. ft. of heating surface in greenhouse.

By means of the sketches and the foregoing we see that the internal area of coils is 2.03 square inches, the drops

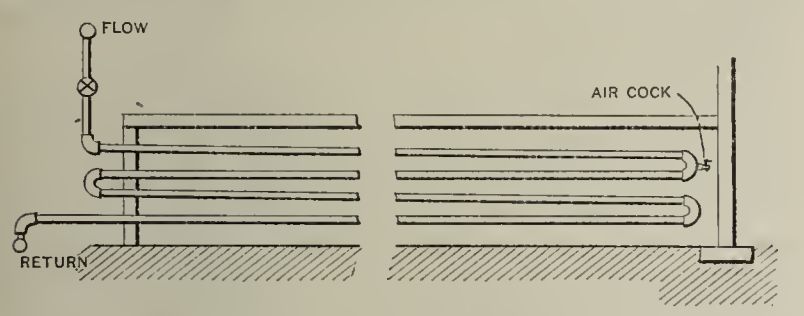
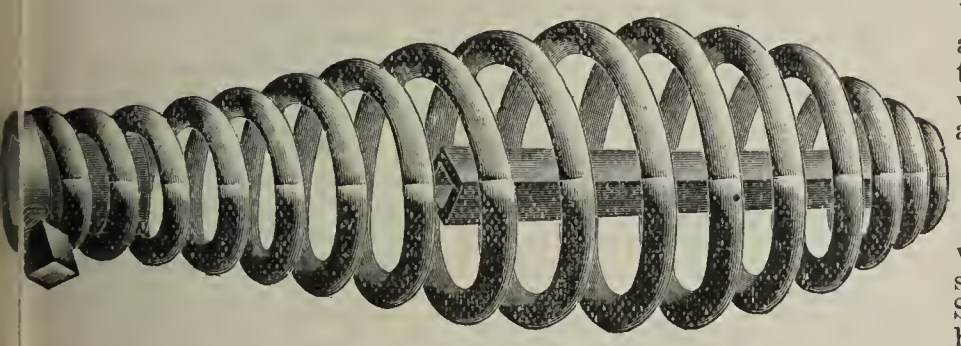


Fig. 3.—Elevation of Coils Under Beds.

the same and the main to supply one coil also the same. The main for two coils is 2½-inch pipe, internal area 4.78 square inches, and the main for three coils is 3-inch pipe of 7.38 square inches internal area. I have placed a 15 gallon tank 12 inches high above the return to boiler, 13 feet to water level when system is filled to this line, giving contents of about 150 gallons. This system will expand nearly 4 per cent., or 5 to 6 gallons; hence the necessity for the 15-gallon tank. I make a 4 inch pipe riser up to hight of 3 inch main and from there out a 1½ inch air pipe. Also attach to the 4 inch riser at this point an independent 1½ inch connection, that can be used for any other purpose desired, as for stable, washing windows, &c., to be shut off, if necessary, by valve, and on each drop place a valve so that any or all of the beds may be heated or shut off as desired without affecting the rest of the system. Thus the areas are proportioned and the flow and return as direct as possible to increase velocity and reduce friction. It is only necessary to put a small air cock on the upper return bend of each coil to facilitate the first starting of the circulation and the system is complete. The independent connection to feed pipe from expansion tank and top of risers makes also a short circuit whereby water can be quickly heated for any purpose, by shutting the valves on each drop, to 212 degrees if desired.

Alaska Soldering Iron Handle.

The Alaska Always Cold handles, made by the Troy Nickel Works, Albany, N. Y., are having a constantly



Alaska Soldering Iron Handle.

widening application. One of the latest uses to which this style of handle is put is illustrated in the accompanying cut, which shows the Alaska soldering iron handle. The spiral is in the usual form of the Alaska handle, but within it is a socket for the end of the soldering iron, while a collar with a set screw holds it firmly in place. It is arranged to fit any iron, and its merits will be readily appreciated by the plumbing and sheet metal trade.

Arkansas Master Plumbers.

A letter from Secretary John M. Dungan, Little Rock, Ark., informs us that President B. J. Dunn, Fort Smith, has issued the call for the fourth annual convention of the Arkansas State Association of Master Plumbers, to be held in Pine Bluff on March 14, and the secretary has sent notices to the members. Those who are in the plumbing business, who are not members of the association, are invited to attend to learn of the objects of the association that they may become interested in its work and become members.

The Attitude of the Master Plumbers Toward Associations, Local, State and National.*

BY JAMES AHERN.

The mission of the association principle, taken in connection with our trade, has been in these later days one of the greatest importance. Plumbers have for years been looked upon as little better than necessary evils, to be universally deplored and condemned, yet, for the lack of more acceptable substitutes, impatiently tolerated. Within a very few years the great principle of Association has worked wonders in removing this not wholly undeserved prejudice from the public mind. Representatives of our trade now meet with that respect and esteem which they may rightly command. United in bonds of fellowship one with another, governed as one body by wise and efficient leaders, they are at least able to take the high place hitherto denied them in the public regard. With increased facilities and opportunities conceded by the manufacturers and jobbers, greatly changed as to their relations with each other, and daily gaining in knowledge and skill, theory and practice, they are in a position to take great onward strides, impossible, undreamed a few years ago. In this brief paper I want to say a word about the relation of the master plumber to these associations, local, State, national, beginning with his first steps into the ranks of the craft. I hope at the end to mention the important movement which has lately taken place in the South and West, the Southwestern League, and its bearings upon the subject in hand.

THE YOUNG PLUMBER.

To begin with, when a young man has adopted the plumbing trade as his honorable occupation in life and has passed successfully through the different stages of apprenticeship, followed by a shorter or longer experience of journeyman, then if he desires to go further and become a master he realizes that to gain this highest point many and varied qualifications are necessary. First, he must have proved himself a good workman. This is absolutely essential. Then he must have honest ambition, urging him on constantly to greater things, with a fixed determination to succeed. Diligent application and strict economy should be the handmaidens of this ambition. Without their help success will always be far off, like a will-o'-the-wisp. He must have a character above suspicion. To begin right is of the greatest importance—to gain that reputation for uprightness and honesty which to a young man starting out means much more than capital, especially as far as credit is concerned. His past history should be creditable in all respects, for when he sets up in business his record is carefully investigated, and then his whole future, to a certain degree, depends upon the favorable or unfavorable report rendered. A reputation is not built up, neither is it destroyed, in a day. Once the young master has started out he should take as his motto, "What is worth doing at all is worth doing well." When he has established himself in suitable quarters and assumed the various obligations imposed by his new position, he should make up his mind to do only first-class work, and if he possesses the other qualifications described above there is no reason why he should not succeed.

ASSOCIATION MEMBERSHIP.

And now, having briefly reviewed the necessary stages which finally make a master plumber eligible, the next step is to join the local association, this leading up to the State organization, then on to the national. The manifold benefits derived from this line of action have been often and eloquently described. Joining the ranks of his fellow craftsmen, he comes into the ranks with them all, and from those longer in the business whose success is assured he will learn much to help him in his own future career. He shares in all the advantages granted to

* Read at the Eighth Annual Convention of the Connecticut State Master Plumbers' Association, New Haven, February 16, 1898.

strength of united numbers—the important concessions made by manufacturers, according to the Baltimore Resolution, receiving that protection now so necessary. He comes into contact not alone with fellow craftsmen of his own city and State, but with hundreds of others all over the country, and bonds of brotherhood and good fellowship are fast knit, to endure for a lifetime. By comparing notes all around, improved methods are discussed and adopted, this profitable interchange of thought being one of the most important gained.

Excepting these and many other benefits from the associations, there are important duties to be performed by the master plumber, young or old. Loyalty goes without saying—earnest co operation, and in regard to all methods proposed or matters discussed, an attitude equally removed from selfishness or suspiciousness, two evils which almost more than any others are most to be feared as dangerous to the highest development and greatest usefulness to organized bodies. The same earnest application to business recommended earlier should find its counterpart in unfailing attendance at all meetings of at least the local association, and, if possible, those of the State. The local meetings especially should be considered of too great importance to be foregone lightly. There is a tendency, unfortunately, too strong among us to stay away, leaving the conduct of affairs to others of a far more conscientious turn. Such a tendency shows a sad lack of that *esprit de corps* absolutely necessary in all organized bodies for the attainment of the best results.

A word about those master plumbers who have refused to have anything to do with our association. Their attitude is a false one throughout. Either they labor under a great delusion in regard to the methods and aim of the organizations spoken of, or else through indifference they neglect to find out for themselves and appreciate as they should all the benefits conferred through the praiseworthy efforts of their brethern. In either case they are content to accept the fruit of other men's labor without paying their rightful share.

INTERSTATE ASSOCIATIONS.

Because a minority of the master plumbers are united and affiliated with the State and National Associations the majority outside in many cases meet with and enjoy undeserved protection, and this is not fair. Something may be done in the near future to remedy this evil. The important movement started in the South and West during the past year has steadily gained ground in spite of early opposition, and here in the North is daily regarded with greater favor. Thoroughly in accord with the National Association, and in all of its provisions showing common sense and sterling justice, this new idea is going to have an immense influence upon the future of the trade. The main principle is to gain from manufacturers and jobbers a promise or agreement not to sell goods to any but master plumbers who are members of the league, provided, however, that they in turn can show a 75 or 80 per cent. membership. The successful achievement of this idea would mean not only the protection which the Baltimore Resolutions already give us, but also protection from each other, by insuring better prices for our work and materials, and this can only be done by maintaining a standard which will allow us a reasonable profit.

As things are now hardly any profit is allowed. Besides the benefit to the plumber, this idea will afford protection to the manufacturers also, inasmuch as one of the resolutions in the constitution of the league provides that " all failure or refusal on the part of members to pay just debts past due on account with the supply house will result in a fofeiture of membership unless satisfactory arrangements are made with their creditors." We will hail with rejoicing the dawn of that better day which will come, when this work has been accomplished successfully. Hitherto we have been well content, after many labors, to make satisfactory terms with manufacturers and dealers ; now, having at last gained this and other benefits, the association has a perfect right to reserve these privileges for her own loyal members. This is what the Southwestern League has been doing and this is what we hope some day to accomplish right here in New England.

A NEW ENGLAND ASSOCIATION

But as yet the time is not ripe. Before we can hope to succeed here as they have succeeded in the South and West in regard to this matter a great deal of preparatory work has to be done. Until we have a sufficiently large number of members to exert the immediate pressure there is little use in trying to pull the measure through. With this end in view it is our duty to enlarge and fortify our ranks as quietly and firmly as possible. Those outside are to be brought in. The weaker brethren already with us, those who have grown lax in their devotion to the cause, should in every way be encouraged and reinvigorated. The rock of dissension upon which so many organizations have struck and gone down seems to be that miserable feeling and jealousy and suspiciousness which should find no place among us. Keeping in mind a clear idea of the real nature of the association—a body organized for the protection of all members alike from common dangers and from this end alone. There seems no reason why feelings of distrust, envy and ill nature should be awakened. Entire confidence and loyal cooperation should rule in all our meetings, and when these are present the discordant elements are put to flight once for all.

In conclusion, the importance of this idea of association in its relation to the welfare of our trade cannot be too strongly urged, neither can the great necessity of loyalty to the duties imposed by this membership be easily overestimated. Future years bring strongest proof of all sound arguments, and it is my firm conviction that it will not be long before the true significance of league association work will have forced itself upon every master plumber in the land. Meanwhile, it remains for us, pioneers, I might say, to keep our honored organization true to their highest ideals, thus helping on the advent of that great day when at last, united in firm and lasting bonds, the Master Plumbers' Association shall stand before us all and rule us, every one—a mighty type of justice, in her hands the unfailing horn of plenty, at her feet unfading crowns of honor.

Massachusetts State Association of Master Plumbers.

The following call, in which especial emphasis is laid on the advantage of forming a New England League, has been issued by President Thomas J. Tute and Secretary Daniel Shannon of the Massachusetts State Association of Master Plumbers:

The nineteenth quarterly convention (including the special meeting) of the above association will be held in Elks' Hall, 24 Hayward place, Boston, Thursday, March 10, 1898, at 10.30 a.m. All local associations are requested to send delegates, and masters engaged in the trade where no local exists are cordially invited to attend. Agreeable to instructions the Executive Committee, in conference with affiliated representatives of New England, launch forth the following platform of principles to govern the operation of the New England League, to wit:

We, master plumbers, representing the States of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut, are to meet for the purpose of forming a league of the plumbing associations of the States named, and invite all persons engaged in the trade to co operate with us as individuals where no associations exist. Such league is to be known as the New England League of Master Plumbers, the objects and purposes of which are declared to be the following:

We acknowledge allegiance to the National Association of Master Plumbers, and pledge ourselves to promote its interests and spread its influence in the territory embraced by the New England League of Master Plumbers.

Whereas, The jobbers and manufacturers in plumbing supplies in the United States, sending representatives or supplies into the New England territory, recognizing in the New England League a movement one of the objects of which is to build up the commercial credit of its members, and thus reduce the risk of selling goods within its jurisdiction, have already given us trade protection as well as moral encouragement and support, be it

Resolved, That the jobbers and manufacturers in plumbing supplies be requested to use their influence in assisting us to build up and hold the membership of our State association; that they be asked to write kindly letters to our wavering supporters, non-members and all new firms which may hereafter enter into the business; to help us convince such firms and individuals if possible that their best interest lies within our local State, league and national associations; to use their influence with us to convince firms wavering between the retail and plumbers' supply houses to adopt either the one, as signers of the Baltimore Resolutions, or the other, as members of the nearest local association, when so requested by the executive officer of the league; and be it further

Resolved, That the only bar to membership in the New England League, not otherwise ordered in the national constitution and by-laws, shall be persistent and willful failure or refusal to pay just debts past due; that those of our members now in arrears with supply houses for accounts long past due be notified that they must make satisfactory arrangements with their creditors during the fiscal year, under penalty of being dropped from the league rolls should they fail or refuse to settle or make satisfactory explanation; that the New England League of Master Plumbers will not tolerate or support members whose names are blacklisted throughout the Union.

Deploring the existing prejudice of the public which questions the honesty and integrity of our calling, we are resolved to employ every honorable means in our individual and co operative capacity to correct such unjust and injurious estimate. It is our aim to educate the people in a

knowledge of the importance of sanitary plumbing as a health factor, and thereby to elevate the business of plumbing to its legitimate plane. It is our aim to disseminate a knowledge of scientific sanitation throughout the country and encourage its application by the use of the most improved methods and appliances; and to this end it is our aim to secure State and municipal legislation, defining and protecting the business of the master plumber, and securing to the public better health with greater economy. It is our aim and interest to secure honest work and the use of reliable materials. We condemn all subcontract work as dangerous to the credit of the craft and unsatisfactory to the people. We desire to transact business with property owners and architects direct.

We recommend and urge the adoption of a sanitary code governing plumbing in cities and towns not already protected by legislation; to this end we urge local plumbers to sign an agreement to use such code until local legislation is secured, and to bind themselves to work for such legislation. We advocate the use of lead pipe as cold water conductors, because it is the best and most economical, and cannot be satisfactorily worked by unskilled craftsmen, whereas any so called plumber can screw together iron pipe and deceive the public. Lead pipe costs more than iron pipe, but it lasts longer. We do not discourage competition, but invite competent craftsmen into our association.

Make it a criminal offense for a plumber to operate without a license. Require each city and town to have an inspector, and let the office be non-partisan, attained to and operated under the merit system alone. Define master plumber to mean one who employs skilled labor only and has an establishment stocked with goods.

Without law and inspection sanitary science is inoperative, the diploma and license useless; the dishonest and incompetent craftsman makes ruinous competition; bad work and worse material are the results. The skill of the honest workman is discounted and useless. Under law and inspection the conditions are reversed. Material must grade up to a fixed standard; cheap and defective goods are prohibited; only competent workmen are employed. The good plumber will get better and the pretender will go, for on skill and rapidity alone will profits depend. Let the people demand scientific plumbing. Let plumbing fixtures be selected with care, having in mind that the cheapest is not the best. Let plumbing fixtures be intelligently cared for and health risks will be greatly reduced. Do not listen to the argument that it will cost too much and bear heavily on the poor. As a rule the poor rent their homes and the cost of plumbing does not fall upon them; the poor man can no better afford to lose his wife or child than the rich by reason of defective plumbing, but it is he who suffers the greatest danger. Tenement houses are more cheaply fitted than those of the prosperous, and it is more often the poor man who pays the penalty of the incompetent plumber than the rich. Be it resolved that it is the sense of this league that our membership should favor those that sell to members only of this league in cities and towns where members exist.

Now, gentlemen, your duty is clear. Make one more effort to get every straggling master plumber in your local association. Give them all another chance. Pay your dues to your State, league and national at once. Your name cannot go on our official literature until your dues are in the treasurer's hands. We protect our members only. You are not a member until your dues are paid. We must complete the official list before the supply men can possibly know whom to protect. The time has come when the people must know the names of the plumbers in whom they can place confidence. We propose to educate the people We propose to protect and build up the business of the plumber. It is, therefore, essential that they who stand upon the side of right shall be publicly known. When the people know the purposes of our league through the distribution of its platform of principles, the people will simply consider as unworthy of respect and confidence the plumber who refuses to identify himself with a movement inaugurated in the best interests of the people and the plumber.

Success wins the respect of the people, not failure. We have tried the cutthroat competitive policy, and our reward has been public suspicion and distrust, public ridicule and financial ruin. We now offer every honest plumber a business copartnership, which means success in business and public respect and esteem. Which will you choose? There are a few, however, in your various localities who require a house to fall down on them before they begin to realize that something has happened. Give these another chance before closing your locals with initiation fees. There are only a few of them left on the outside. We can afford to be patient and generous. Let every man work now to save some erring brother the inevitable ruin which is sure to follow the public knowledge of his refusal to co operate with business men for prevention of disease and the elevation and dignity of the plumbing business.

Bay City Master Plumbers.

The following is the list of officers of the Master Plumbers' Association of Bay City, Mich., for which we are indebted to Secretary G. H. Burge, 407 Midland street, West Bay City, Mich.:

President, W. H. Sullivan.
Vice President, T. E. Smith.
Secretary, G. H. Burge.
Treasurer, A. Walther.
Sergeant at-Arms, J. Young, Jr.

Mortality Among Plumbers.

There has just been issued by the Registrar-General of England and Wales, says the *Plumber and Decorator*, a voluminous Blue Book dealing with the mortality of men engaged in different occupations, and some very interesting facts are given respecting plumbers. Under this heading, which by the way includes the kindred occupations of painters and glaziers, there were enumerated at the last census 166,135 males above 15 years of age, and during the years 1890, 1891 and 1892 there were registered 7545 deaths among this body. The comparative mortality figure of plumbers at 25-65 years of age—the main working period of life—is 1120, as compared with 1000 for all males.

From lead poisoning these workers suffer severely, the deaths which are definitely returned under this head giving the high mortality figure of 19. It is true that this is small when compared with the enormous mortality of lead workers and file makers from the same cause, but the two latter are the only occupations in which the mortality from this disease exceeds that of plumbers, painters and glaziers. Separate examination of the returns relating to plumbers on the one hand and to painters and glaziers on the other shows very little difference in the liability of these workers to lead poisoning, the difference, such as it is, being slightly unfavorable to plumbers. Many of the workers, however, follow both occupations. Lead poisoning is probably the primary cause of the excessive mortality from gout and from diseases of the nervous and urinary systems. From phthisis, cancer, bronchitis and Bright's disease the death rate of plumbers is in excess of the average.

NOTES.

The situation in Plumbers' and Steam Fitters' Brass and Iron Goods is still somewhat unsettled, but a distinct tendency toward higher prices is noted. A prominent manufacturer of Plumbers' Brass Goods in the East is reported to have withdrawn all quotations during the past week, and it is believed that others are ready to follow suit. The idea prevails in the trade that moderate advances may be looked for all along the line at an early date. Meanwhile business is of small proportions, orders being confined almost wholly to the filling of absolute requirements, which at this season are normally light.

At the meeting of the Master Plumbers' Mutual Protective Association of Baltimore, Md., last week, 101 names were enrolled for membership. A committee composed of W. P. Lenderking, chairman; E. A. McAllister, George S. Walker, J. B. Hagger, Thomas Forrestell, Charles A. Erich, Mr. Herget, Charles Inderiden and William B. Tyler was appointed to wait upon the dealers in Plumbers' Supplies to ascertain if they proposed to recognize the association. The association will meet in G. A. R. Hall every Tuesday night.

Plumbing Inspector Hopkins of Memphis, Tenn., has had an interview with Mayor Williams with a view of providing better plumbing regulations for the suburbs by extending the city regulations to cover the entire territory of Greater Memphis.

The report of Plumbing Inspector Reuben Bemis of Providence, R. I., states that the percentage of defective work found during the past year was 15. This is a decrease from last year. The first year of the department it was 42 per cent. The total number of plans filed for plumbing and drainage during the year covered by the report was 3883, 2785 being for plumbing and 1138 for drains. Of this number 561 were for work in new houses, and 2184 for work in old houses. In 2425 instances connection was made with public sewers, and in 320 instances connections were made with cesspools. The value of the work performed was $368,086.52. The number of inspections required on these jobs was 6656 on plumbing and 1442 on drains, making a total of 8283 inspections; including the examinations of other kinds, 185. The report favors the use of the front wall or intercepting trap.

The National Sunlight Gas Company, Minneapolis, Minn., have found the demand for their Acetylene Gas Generator so great that they have outgrown the capacity of the Miller Sheet Metal Works, 126 First street North,

and are arranging new quarters at 100 First avenue North.

Henry C. Weeden, Boston, Mass., announces that owing to the blizzard he has postponed the entertainment intended for February 1 until February 22, when an increased number of exhibits will be made of Plumbing Goods and additional attractions will be provided and further gifts made. It gives promise of being a gala day for plumbers.

An ordinance to further regulate plumbing has been passed at Nashville, Tenn. It puts in control of a board of plumbing commissioners all plumbing work done in the city and provides an inspector of plumbing, and requires that plans of proposed work shall be submitted to the inspector for approval.

J. H. Bradley & Co., have opened a plumbing showroom and shops at McHenry, Ill.

The McElwaine-Richards Company, Indianapolis, Ind., report a 50 per cent. better business in Steam and Plumbing Supplies and better prospects than at the same time in 1896, and collections are said to have equally improved.

A German plumber in an Eastern city stated tc a Plumbers' Examining Board that he did not understand English well enough to take an examination, but that he knew his business and was going to work, license or no license.

The Weisel Acetylene Gas Company, Bucyrus, Ohio, are just putting their Generator on the market.

E. Percy Johnson has removed his plumbing establishment from 180 East Main street to 19 Market street, Louisville, Ky.

The Board of Health of Greater New York, at a meeting on February 10, abolished two departments of the board, one in Brooklyn and one in Manhattan. That in Brooklyn is the Bureau of Plumbing and Drainage and that in New York is the Bureau of Mercantile Establishments. The new charter provides that the Building Department shall have charge of plumbing and drainage.

Harry Marchant has opened a plumbing shop at Marion, N. Y.

William I. Grady has opened a plumbing shop at 138 Arnold street, Woonsocket, R. I.

The Sullivan Plumbing & Heating Company, Bay City, Mich., have had flattering reports from a large number of customers for whom they have set the Colton-Smead Under-Feed Furnaces. They are also doing a good business with a new Incandescent Gas Apparatus.

The city of Malden, Mass., will receive bids until February 24 for plumbing and heating and ventilating Ward 3 School.

Speaking of the changes produced in iron by the action of the elements, says the *American Architect*, it is singular that the influence of hot water upon brass, so familiar to plumbers, should not have been more thoroughly studied by scientific men. Every one who has had much to do with plumbing fixtures has observed that the washer screws and other small parts of brass hot water cocks and valves become, in the course of years, brittle at the edges. An attempt to take out such a washer screw with a screw driver results in crumbling the head away, the metal being apparently crystallized on each side of the slot ; while other edges, originally sharp, appear rounded, or become so by the crumbling of the metal when handled. We will not attempt to account for this phenomenon, but it would certainly be of advantage to owners of steam pumps, engines and other machinery in which brass is used, as well as to plumbers, to have an investigation made into the circumstances under which it takes place and the chemical or physical character of the change involved.

The new letter head of the Geo. B. Cobb Company, 44 Centre street, New York, is well calculated to make a good impression on the prospective purchaser of a Heating Apparatus. A half-tone engraving of a fine country house adorns the upper corner in blue tint, with "Steam and Hot Water Heating Apparatus for Suburban Homes our Specialty" in red beside it, printed on a rose colored paper.

The New York office of the Niagara Radiator Company, 44 Centre street, has just been refrescoed in two shades of green with a very pleasing effect. Their line of Niagara and Niagara, Jr., Radiators for hot water and steam have been redecorated and Harry Sedgwick, assistant manager of the company, is in charge, prepared to extend a welcome to the heating contractor.

The Beaton & Bradley Company, Southington, Conn., have got out a very handsome sample board showing their Floor and Ceiling Plates in nickel and bronze plate and their Pipe Hanger for the use of dealers handling their goods.

The attempt to organize all the sewer pipe makers of the country in one large combination, to which end negotiations have been on foot for some time past, is reported to have been abandoned. Failure to enlist some of the leading interests in the scheme appears to be the obstacle which stood in the way of its consummation.

A. E. Weiant and Chas. Bromley have entered into a partnership and have opened a plumbing establishment at New Britain, Conn.

J. D. Coover has opened a plumbing shop at 412 Spring avenue, Harrisburg, Pa.

Scatchard & Malone succeed Thomas Scatchard in the plumbing business at Little Falls, N. Y.

H. O. Taylor, who has been in the plumbing business at Danbury, Conn., has opened a plumbing establishment on Elm street near Main, in Bridgeport, and has taken W. D. Nichols into partnership with him. The new firm will be Taylor & Nichols.

The trustees of Rutgers College, New Brunswick, N. J., have decided to conduct examinations and grant certificates in municipal hygiene to officers of local Boards of Health, Sanitary Inspectors, Factory Inspectors, Plumbing Inspectors, and to those who may seek appointments to these positions The examinations will be designed to test the fitness of persons who may be called upon to engage in the execution of the health laws. Examinations will be held on the first Wednesday of the months of March, June and October at the college buildings in New Brunswick. These examinations will be open to men and women. A certificate of competency, signed by the examiners, and bearing the seal of the college, will be granted to each successful candidate. A list of successful candidates will be furnished to the State Board of Health and, on application, to local Boards of Health.

The Wm. S. Haines Company, Philadelphia, manufacturers of the Heintz Steam Trap, have opened a branch office in the Second National Bank Building, Pittsburgh, in charge of Eliot A. Kebler.

The Milwaukee master plumbers who failed to pass the examination now required by the Wisconsin laws have employed counsel and attacked the constitutionality of the act requiring an examination. Proceedings were begun on the 11th inst. in the Superior Court.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D.C., until March 8, for a low pressure exhaust steam heating, mechanical ventilating apparatus, cold and hot water supply, &c., for the U. S. Post Office, Court House and Custom House Building at Milwaukee, Wis., in accordance with the drawings and specification, copies of which may be had from the office of the Supervising Architect, Washington, or the Superintendent at Milwaukee.

The Canning Industry.

The fruit and vegetable canning industry of the United States represents an invested capital of $15,000,000, with an annual trade of about $30,000,000, and employs more than 60,000 persons. It is chiefly carried on in two States, Maryland and New York. The fish canning business of this country is carried on at 100 establishments, in which more than 5500 persons are employed. The value of the canned fish output is $7,000,000 a year. The chief product in this line is in canned salmon, which is mainly put up in the State of Oregon. In the East more than 2500 persons are employed in fish canning in Maine and 700 in Massachusetts. The oyster canning industry of the United States is conducted in less than 20 establishments, which do a business of between $3,000,000 and $4,000,000 a year, employing 3500 persons. Eighty per cent. of this branch of business is done in the State of Maryland.

The Hermann Time Detector Company have been incorporated at Youngstown, Ohio, by W. C. Hine, F. P. Hood, W. K. Osborn, U. C. Greenwood and William Cornelius for the purpose of manufacturing the Hermann watchman's time detector, a machine recently patented for use in registering the movements of a night watchman in manufacturing and mercantile establishments, hotels, banks, office buildings, &c. The claim is made that this device is very simple, doing away with all complicated apparatus, and yet is thoroughly reliable and absolutely proof against interference by dishonest watchmen. Another strong point in its favor is the low cost of installation.

TIN PLATES.

A Suggestion to the Welsh Tin Plate Makers.

That American tin plate makers do not take a fiendish delight in, or even view with indifference, the woes of the Welsh manufacturers, whose business, so far as this country is concerned, they have wrested from them, is proved by the following letter which has reached us from Wm. N. Follansbee of Follansbee Bros. Company, Pittsburgh, Pa., in which he offers them a practical suggestion for a new outlet for their product.:

Apropos of the general condition of the tin plate business in Wales and frequent mention of the desire there for new outlets for this product, it has always seemed very singular indeed to the writer that our English and Welsh cousins have never considered the matter of tin roofing, notwithstanding the fact that they have manufactured and sent to this country so much material for this purpose. It has been proverbial, of course, in the past how densely ignorant the Welsh manufacturers of plates have been of the purposes to which their output has been applied. Before the days of manufacture in this country the writer, when visiting England and Wales in connection with our purchases from foreign works, was surprised at his inability to find a single tin roof. Such a thing was unknown right in the home of the tin plate industry. Following an inquiry as to this condition of affairs, it developed that having always used slate or thatch for roofs as a consequence John Bull was inclined to so continue to the end of the world, adding, of course, "you know slate is so cheap here," although investigation did not show such was the case compared with the cost of tin.

We understand at the present time a large export business is being conducted in this country in sending American slates to England. Of course we want none of the foreign plates in this country, yet a world wide use of tin plates for every purpose possible in the long run must prove beneficial to the entire industry, no matter in what country located. Possibly you can make a suggestion to the Welsh manufacturers that the question of tin roofing in the United Kingdom is worthy of their best attention. To show generally how uninformed they are as to the use of their product, the writer may mention that one of the very largest producers of roofing tins in Wales made the inquiry, "What do you use ternes for in the States?" He could hardly be made to believe that more than an incidental proportion of the quantity of the ternes sent here were utilized for roofing purposes.

Some time ago this matter was agitated in South Wales, and the proposal to try and imitate the use of terne plates for roofing purposes in the United Kingdom was received with some favor. As a start, a new market or other public building in Swansea was, by the efforts of the tin plate makers, ordered to be roofed with tin and, if we remember rightly, the Welshmen went so far as to get a skilled roofer from this country to lay it. A tin plater in the Briton Ferry district was also announced to have put a tin roof on his new cottage. Beyond these instances, we have not heard of the movement making further headway. The conservatism of John Bull, referred to by our correspondent, doubtless accounts in a large measure for the blindness of the British to the merits of tin as a roof covering; but we believe that the extreme humidity of the British climate is regarded on the other side as inimical to the use of metal roofing of any kind. Possibly this may account for their failure to avail themselves of the cheap roofing material which lies so close to their hand. Perhaps some of our Welsh readers will favor us with their views in the matter.

At the annual meeting of the stockholders of the Ohio River Sheet & Tin Plate Company, at Remington, Pa., the following officers were elected: Alex. Saulters, president; W. J. Caskey, vice-president; A. G. C. Rhodes, secretary and treasurer. Directors: Alex. Saulters, Thomas P McDonough, M. Rood, George Wood and Jesse Delo. Auditing Committee: W. J. Caskey and H. W. Pavitt This concern manufacture Black Plate for tinning, having an annual capacity of about 4000 gross tons.

SCRAP.

There has been an almost general advancing tendency in the metal trade, excepting Tin Plate, however, which is selling as low as ever.

The efforts to bring about a consolidation of Tin Plate interests are being continued, but it is understood that one leading concern, while willing to co-operate in putting the industry upon a better basis, are determined to maintain their independence. As the concern in question are one of the very largest in the country and are intimately allied with a jobbing house who form one of the most important factors in the distributing trade, the obstacle their attitude presents to an effective combination is a serious one.

The firm of Saunders, Fielding & Bond, New York City, have dissolved the partnership by mutual consent. The Tin Plate and Metal business of the firm will be continued by F. E. Vivian Bond, under the style of Vivian Bond & Co., at the Coffee Exchange Building, 66-70 Beaver street, New York.

The Shenango Tin Plate Company, New Castle, Pa., have placed an order with the Leechburg Foundry & Machine Company, Pittsburgh, Pa., for 26 36-inch Doubling Shears, four 40-inch Doubling Shears, five 56-inch Roll Lathes and six No. 2 Mesta Patent Pickling Machines. This is said to be the largest order for Doubling Shears ever placed. The Leechburg Foundry & Machine company have sold 25 of their Mesta Picklers in the past 12 months.

The monthly statement of dutiable goods in bonded warehouses at the port of New York shows that 2,510,802 pounds of foreign Tin Plate, valued at $54,515, were so held on January 31, as compared with 3,490,356 pounds, valued at $71,452, on the corresponding date of 1897.

The Lloyd Booth Company, Youngstown, Ohio, are building 126-inch knife Squaring Shears for the Ætna-Standard Iron & Steel Company, Bridgeport, Ohio; the Reeves Iron Company, Canal Dover, Ohio, and the Cambridge Iron & Steel Company, Cambridge, Ohio. They are also completing three 24 inch Sheet Mills for the last named concern.

The exports of Tin Plates from Great Britain to the United States in January last amounted to 8883 tons, as compared with 10,123 tons in the previous month and 8810 tons in January, 1897.

We have received from Riter Bros. & Co., 1022 Race street, Philadelphia, a set of samples of their special brands of American Roofing Tin. These are six in number, as follows: Riter's Guaranteed Hand Dipped, Riter's Roofing, Riter's Extra, Riter's Special, Riter's Lehigh and Riter's York, bearing 46, 35, 25, 20, 16 and 10 pounds of coating respectively. The samples are 7 x 5 inches in size and are attached together by steel rings, a card between each sample giving the name and a complete description of the Plate represented, with prices and other details.

At the recent meeting of the Atlanta Steel & Tin Plate Company, Atlanta, Ind., the following officers were elected: C. A. Ford, president; Theo. D. Morgan, vice-president and general manager; A. G. Walton, treasurer, and E. S. Walton, secretary and assistant treasurer. C. A. Ford, Theo. D. Morgan, A. G. Walton, E. S. Walton, J. G. Dunn, W. D. Parr and A. D. Booth were elected directors. The company's plant has had a very successful run during the past year, turning out a large and satis factory product.

The Tin Plate mill of the Neshannock Sheet & Tin Plate Company, New Castle, Pa., started into operation last week.

Ambrose Beard, Jr., has been appointed general superintendent of the plant of the Star Tin Plate Company of Pittsburgh, Pa.

Another Tin Plate concern in the Swansea Valley, the Ynispenllwch Works of Clydach, South Wales, are reported as going into the manufacture of Galvanized Sheets.

THE RETAIL STORE.

THE MINNESOTA RETAIL HARDWARE DEALERS' ASSOCIATION.

OPENING EXERCISES.

A large and enthusiastic gathering of Hardwaremenfaced President Charles F. Ladner in the United Commercial Travelers' Hall, Minneapolis, on the morning of the 9th inst., when he called the second annual convention to order. The hall easily seats 300, and everA chair appeared to be occupied by members of the Minnesota Retail Hardware Dealers' Association and interested visitors. After a few words of greeting to the assemblage and remarks by Mayor Pratt of Minneapolis and others, Secretary J. W. Clark called the roll of members. The following names were registered:

Ole Fyetstad, Lake Benton.
A. A. Fravaten, Kent.
J. N. Fsyder, Osceola, Wis.
F. H. Casey, Princeton.
Ofenlock & Buel, Kasota.
Hundy Brothers, Long Prairie.
Pattridge Brothers, Kenyon.
Wm. Guir, Ortonville.
Reuben D. Wise, Adams.
Albert Kraus, Minneapolis.
H. C. Esty, Cyrus.
H. Hood, Kinsington.
E. Smith, Minneapolis.
B. Just, St. Paul.
Schlick Brothers, St. Paul.
Thompson & Hobberstad, Lanesboro.
Schlick Brothers, North St. Paul.
J. G. Koffken, Green Isle.
Chris Juni, Jordan.
Bishof & Anderson, Blue Earth City.
Hutz Brothers, St. Paul.
C. H. Casey, Jordan.
Johnson & Johnson, Gibbon.
Gameson & Kraukiema, Montgomery.
Stronks & La Page, Baldwin, Wis.
Wm. O. Paige, Alisten.
P. P. Quist & Co., Winthrop.
Belmke & Oetting, St. James.
N. A. Lilyquist, Winthrop.
Jos. Mason, St. Peter.
C. E. Krause, New London.
A. A. Lindeman, North Redwood.
Vetunn & Clark, St. James.
Olson & Weiske, Belgrade.
C. N. Barnes, Grand Forks, N. D., secretary North Dakota Hardware Association.
John Hammerman, Young America.
J. R. S. Cosgrove, Le Sueur.
J. L. Watson, Wahpeton, N. Dak.
W. G. Hopp, Rush City.
G. A. Lewis, Mankato.
Herman Stege, Nicollet.
C. E. Jenson, Nicollet.
M. Olson, Atwater.
Ole A. Christenson, Atwater.
J. C Stuhlman, St. Paul.
J. F. Vanusek, Montgomery.
Schultz & Masch.
J. A. Wadsworth, Glencoe.
J. E. Nash, Minneapolis.
L. Thielman & Son, St. Cloud.
A. K. Pederson, Appleton.
O. F. Olson, Brandon.
F. H. Retzloff, New Ulm.
Erickson & Lawson, Murdock.
Otto Rood, Minneapolis
Erickson & Hillekson, Wheaton.
John Erickson, Hancock.
S. B. Bartram, Zumbrota.
Lee & Crooks, Benson.
R. L. Warner, Eden Valley.
E. F Munger, Pine Island.
D. W. Marvin. Pine Island.
A. Beersdorf, New Germany.
Wm. Russell, Stephens.
Simmer & Marzolf, St. Paul.
J. F. Wohlhutter, Albert Lea.
H. O. Amunson, Clear Lake, S. Dak.
H. R. Schroeder, St. Paul.
R. A. Schatz, Glencoe.
J. J. Goetzenberger, Minneapolis.
H. Traner, Hutchinson.
O. J. Johnson, Waseca.
Hauser & Tester, Gibbon.
Hunser & Reeke, Fairfax.
Hunser & Parsons, Franklin.
A. C. Vaughan, Minneapolis.
C. W. Kelley, Devil's Lake, N. Dak.
H. Harrington, Fargo, N. D.
E. H. Heins, Renville.
B. F. Heins, Renville.
C. A. Peck, Berlin, Wis., secretary Wisconsin Hardware Association.
Kurl Brothers, New Prague.
Gus Lindemann, Milan.
B. Fielsam, Royalton.
Johnson & Eleston, River Falls, Wis.
L. H. Hornburg, New Ulm.
Aug. Hartelt, Norwood.
C. M. Groschen, St. Bonifacius.
R. B. Hall, St. James.
Ben Clayton, Taylor's Falls.
W. H. Vollbrecht, Hanover.
K. Record, Farmington.
L. P. Albrecht, Glencoe.
Wright & Anderson, Mantorville.
W. H. Tomlinson, Le Sueur.
A. Dahl, Bird Island.
John McMullers, Shakopee.
C. C. Bick, Winona.
A. G. Hunff, Alden.
C. A. Zabel, New Paynesville.
H. S. Cleveland, Minneapolis.
Louis Gewalt, Breckenridge.
Clement Schroeder, Mankato.
How Brothers & Co., Sauk Centre.
Chas. F. Ladner, St. Cloud.
C. W. Bruck, Royalton.
Stremel Brothers, Minneapolis.
H. E. Humphrey, St. Paul.
Weiland & Wade, West Duluth.
D. Y. Butler, Brownton.
Henry Yost, Minneapolis.
E. W. Dunton, Annandale.
J. N. Silow, Clarkfield.
Peterson & Berg, Madison.
L. A. Williams, Pelican Rapids.
Schroeder Brothers, St. Paul.
Anderson & Schock, Cresca, Iowa.
J. A. Peterson, Canby.
Wm. Von Kuster, Litchfield.
Gardner, Warner & Davis, Minneapolis.
Cotrell & Fradenburgh, Faribault.
P. L. Norman, Montevideo.
Chas. F. Vanasek, New Prague.
A. Puck, Dayton.
J. E. O'Brien, Crookston.
O'Brien Brothers, Red Lake Falls.
Evins & Herdliska, Princeton.
Muzzy & Ryan, Wadena.
Houghtaling & Coult, Fairmont.
McKinley Hardware Company, Cottonwood.
Brutsch & Field, Renville.
Evenson Brothers, St. Peter.
A. T. Stebbins, Rochester.
H. H. Oristuhl, Dawson.
H. J. Wartman, Watkins.
H. O. Roberts, Minneapolis.
Geo. D. Parmlee, Rochester.
Cowing, Rombards & Co., Alexandria.
G. Boehm & Son, Minneapolis.
O. F. Peters, Cannon Falls.
Hagstron & Lyser, Lowry.
A. H. Ames, Northfield.
Sabe Zimmerman, Mankato.
E. M. Fairfield, Osakis.
E. A. Moye, Duluth.
F. A. H. Smith, Minnesota Lake.
E. Trahms, Minnesota Lake.
Geo. W. Cahoon, St. Paul.

Following the President's address Secretary J. W. Clark was called upon for his report, and read a very comprehensive statement of the work done dur-

ing the ten months in which the association has had an existence. This report is not only interesting to the members of the Minnesota Association but is also of much value to the Hardwaremen in other States who contemplate the formation of a similar organization, but do not know exactly how to get to work to secure the desired results. Copious extracts are given as follows, the document being too long for its entire reproduction :

Report of the Secretary.

This report contains much detail, but was written to show you the actual work performed and for other reasons that may appear later on in the meeting. These will, perhaps, suggest matters to your mind upon which you may desire to speak.

The movement to organize this association was the result of agitation which had been very general throughout the State for several years. The movement seems to have originated at St. Cloud. At the meeting there arrangement were made for calling the Hardware dealers of the State together at St. Paul, April 29, 1897, when over 200 business men met to devise ways and means of correcting the evils of which they had so long and bitterly complained.

The large number of dealers present and the fact that 60 of them then and there paid their money and became charter members is positive proof that they were gathered together with a firm and steadfast resolution to form the nucleus from which it was believed much benefit would result to the Hardware business of the State. While the number to join at this time was, perhaps, not as great as it might have been, yet it was none the less a record breaker to start with, as will be seen later by comparison.

With the selection of the secretary the association may be said to have been completed and ready to proceed to business. The membership was now 100. The office was located in a commanding position, about as far from the face of the earth as possible. The secretary, on June 7, armed with a little nerve and a large bundle of unanswered correspondence, filled with encouragement, but short on cash, went to work. It being necessary to have as complete a list of retail dealers as possible, this work received attention first. Through jobbers it was learned that there were nearly 2500 dealers selling Hardware in the State. Upon investigating the jobbers were found responsible for this. Their list included well diggers, tin shops, blacksmiths, repair men, junk shops and supply houses. After checking and rechecking several lists and reports, a revised list of nearly 1300 names of retail Hardware dealers was completed.

Preparing the lists of jobbers and manufacturers was slow work, as it was to contain only those doing business in this State. There being no such list published, the only practicable way was to apply to the retail dealers to furnish a list of the jobbers and manufacturers known to do business in this State. This was done ; many lists were received, and much time was consumed in checking them over and recording them, but finally a list of 400 names was completed. As soon as these lists were completed, the work of sending out the above mentioned letter was begun. To the retail dealers a copy of the constitution and by-laws and an application blank were sent. The letters to the jobbers and manufacturers requested them to make reply stating their position relative to the association, a copy of the constitution and by-laws being inclosed that they might understand its nature and object. They were informed that where silence was maintained and no reply made the party addressed would be considered as unfavorable to the association.

Making a list of trade papers, sending them copies of circular letter, writing up membership book, making record book of members by counties, sending out membership cards, transcribing the constitution and by-laws and record of meetings held, occupied the time of the secretary to July 8, when the next Executive Committee meeting was held. The meeting was called to consider the work done and to prepare plans for the future. It was learned that while a great many jobbers and manufacturers had replied favorably to the letter sent them, there were many who had made no reply. In order that there might be no misunderstanding the secretary was instructed to prepare and send a second letter to all the jobbers and manufacturers in the cities of Chicago, Milwaukee, St. Louis, Dubuque, Duluth, St. Paul and Minneapolis. The committee passed upon the letters received from jobbers and manufacturers and instructed the secretary to prepare a list of those favorable and unfavorable. After reviewing work of secretary and considering other matters of the association the meeting adjourned. The secretary found that in the cities above named there were 81 jobbers and manufacturers who had not replied to the first letter sent them; the second was prepared and mailed them at once.

In accordance with the constitution, the president appointed a county organizer in each of the 54 counties wherein there were members. Supplies and a list of all members in their respective counties were sent to them. This was done to facilitate their work, which was expected to greatly increase the membership.

The letters from jobbers and manufacturers were in many cases evasive, and much information was demanded; this entailed a large amount of correspondence. July 15 having arrived (the date specified in the letters to jobbers and manufacturers), a record was made of all replies received ; those favorable and unfavorable to the association were arranged in alphabetical order and pasted in separate books prepared for the purpose. A list containing the names and addresses of 230 jobbers and manufacturers was prepared and sent to all dealers in the State. Of this number, 173 had sent favorable replies, wishing us the greatest of success and in some instances offering financial aid ; of the remaining 57, reported unfavorable, many were so reported because of their not having made reply. The list, in the hands of the retailer, had the desired effect, and soon many letters were received from jobbers and manufacturers seeking information, and several of the most important ones were anxious that a new report be issued at once showing that they were favorable to the association ; many of these letters were very emphatic and in most positive terms agreed to discontinue selling their goods to a certain class of dealers.

About the middle of August another letter and list were prepared and sent to all the dealers, showing the additions and changes made. With the hopes of getting in some new members from those who had attended the first meeting at St. Paul and had not yet joined, 80 of them were sent a special letter. Since then 30 of these have become members.

On August 24 the Executive Committee again met, the work of the secretary since last meeting of the committee was looked over, and general matters of the association considered. The question of the handling of stoves by the different classes of dealers was considered, and a resolution passed ; the secretary was instructed to send a copy to all members. On motion, a resolution was passed allowing all dealers to join the association between September 1 and the annual meeting upon the payment of the membership fee and one-half the annual dues, and the secretary instructed to notify all non-members. On August 31 this stove circular was sent to all the members; the effect it produced proved that many of them were loyal. Much correspondence was the result, and the secretary had the pleasure of meeting many of the representatives of stove dealers, who called to explain, and to have explained, and the end is not yet. The circular letter was sent to all non-members, soliciting their membership. List No. 3 was sent to all dealers in the State. A special letter was sent to the county organizers, urging upon them the importance of having their county well represented.

The secretary at this time started out to solicit membership of the dealers in the twin cities. At St. Paul obstacles were encountered over which the secretary had no control, but at Minneapolis the work was very successful. There being nearly 100 dealers in these cities, much

time was consumed, about 150 visits being made. President Ladner instructed the secretary to advance upon the country, so on October 18 this work was begun. From the 126 dealers called upon 89 new memberships were obtained, being about 75 per cent. The total number of new memberships obtained through solicitation by the secretary was 128.

On June 4 the Executive Committee was again called together by President Ladner. Secretary's report of work done since August 24 was gone over, complaints were considered and the secretary instructed to report several jobbers unfavorable to the association. The following resolution was passed:

Resolved, That it is the sense of this committee that at our next annual meeting a committee of three be appointed to meet a like committee to be appointed by the Wisconsin and North Dakota associations, to consider the advisability of organizing a Northwestern Association of Retail Hardware Dealers, and to formulate by-laws and resolutions to govern the same ; that this committee be subject to the call of the president of the Minnesota Retail Hardware Association.

There are now in the United States the following State associations of retail Hardware dealers:

Indiana Hardware Association.
Kentucky Hardware Association.
Michigan Hardware Association.
North Dakota Hardware Association.
Ohio Hardware Association.
East Tennessee Hardware Association.
Wisconsin Hardware Association.
Minnesota Hardware Association.

In Iowa an association was organized several years ago to oppose the Nail trust and they had plans ready to build a Nail mill. The trust heard about it and dissolved, and the project to build the mill was abandoned. There are other Hardware associations in different States who meet in a social way to exchange ideas and discuss business methods, &c.—sort of mutual admiration societies, but who have not as yet taken hold of the more serious side of business affairs as most of those above mentioned have done. But the movement is spreading. Very recently the New England States have taken up the question, and Pennsylvania will no doubt hold a meeting for the purpose of organizing. Letters have been received from dealers in several other States asking for information for the purpose of organizing. February 7 an old established firm in Texas wrote for full particulars, which will be sent them.

The Ohio Association seems to have been the first to enter the field, organizing October 10, 1894, with 10 members the first year, 20 the second, 65 the third, and they expect 100 members at their February meeting this year. There are 1100 legitimate Hardware dealers in that State. The secretary informs me they propose to make a vigorous campaign the coming year

The Michigan Association was organized July 9, 1895, with 20 members, and they have about 100 now. They have adopted our resolution No. 2 and now propose to carry the war into Africa if necessary.

The Wisconsin Association was organized February 9, 1897, with 40 members, and 61 have joined since. Secretary Peck reports a growing interest by the dealers and expects 50 more to join at their annual meeting. This report was sent to me January 25, 1898. On February 2 they held their annual meeting, and from a letter just received from Secretary Peck they not only received the additional 50 but a number more. As we are favored by the presence of Mr. Peck, I hope we shall have the pleasure of hearing from him on this subject.

The Indiana Association was organized February 24, 1897, with 30 members. A number have joined since, and they are making special efforts to get all dealers in the State to attend their annual meeting February 23 and 24, 1898, at South Bend, and expect to receive many new members at that time. The secretary suggests that all States of the Central West be joined together in the common cause.

The North Dakota Association, the youngest of all, has made a fine record. It was organized September 20, 1897, with 28 charter members. Fifty-seven have joined since, giving them a total membership of 85 to January 29, 1898. Owing to trade conditions existing in that State, and the difference in the constitution and by laws from ours, there are only about 160 retail Hardware dealers who are eligible to membership in their association. Secretary Barnes writes me that they have now about 100 members. As he and President Kelley are also with us I trust we shall hear from them to our advantage. The late increased interest in their association should have a wholesome effect upon us.

It will be remembered that the Minnesota Association was organized April 29, 1897, with 60 charter members. It has since increased its membership over 400 per cent., having to day 330 members in good standing, making it the largest retail Hardware association in the United States. Three of our members are from our sister State of Wisconsin. We have members in every county in the State (where there is a Hardware dealer), with the exception of three. No other association has prepared and sent lists of jobbers and manufacturers to all Hardware dealers in its State as we have done. In doing this it has given us much greater power and influence than otherwise would have been possible in the beginning. Owing to the expense it may be deemed necessary to send reports to members only in the future, and now, having such a large and influential number of dealers as members, this plan can no doubt be adopted with safety. Others will see that it is hardly fair to reap unless they sow, and will probably send in their fees and become members soon.

The financial statement of the association is as follows:

Receipts.

Membership fees from 330 members	$660.00
Dues from 330 members, including $67.50 paid in advance for 1898	926.25
Total receipts	$1,586.25

Disbursements.

Expense of organizing	$149.76
Bond for treasurer	10.00
Office furniture	21.00
Office expense, books, &c	20.55
Postage	114.00
Rent to February 7, 1896	80.00
Printing	105.69
Salary of secretary	800.00
Milwaukee meeting, expenses Mr. Stebbins	21.60
Stenographer	28.00
Expenses secretary soliciting membership	150.18
Postal cards	11.00
Railroad company's joint agent	3.50
Total paid out	$1,515.28
Balance on hand in hands of treasurer	70.97

The next step in this movement is the formation of a similar association of all the regular and legitimate Hardware dealers of the Northwest. The climax of the movement will be such an association of all the regular dealers of the United States. The important business, therefore, is to take the next step, as before indicated, and to take it right.

Wednesday afternoon the election of officers for the ensuing year was the first business disposed of. The list elected is as follows:

President,

Charles F. Ladner, St. Cloud.

Vice-President,

Hon. A. T. Stebbins, Rochester.

Executive Committee,

W. H. Tomlinson, Le Sueur.
C. F. Stremel, Minneapolis.
John Schleck, St. Paul.
James E. O'Brien, Crookston.
J. P. Watson, Marshall.
E. A. Moye, Duluth.
Clement Schroeder, Mankato.

The president and vice-president are members of the Executive Committee by virtue of their office. The secretary and treasurer are elected by the Executive Committee.

C. N. Barnes, secretary of the North Dakota Retail Hardware Dealers' Association, was invited to address the

convention, and did so at some length, expressing his pleasure at the opportunity afforded him of meeting his Minnesota brethren.

Secretary C. A. Peck of the Wisconsin Retail Hardware Dealers' Association, being invited to address the convention, made a stirring speech in which he set forth the character of the work being done in Wisconsin.

B. W. How of Sauk Center read a paper on "Unselfish Loyalty to the Association."

E. A. Moye of Duluth followed with a paper on "The Success of Our Association," and James E. O'Brien of Crookston read a paper on "The Work of the Association."

Thursday Morning.

Resolutions of various kinds were read after the convention had been called to order. One was from the Retail Furniture Dealers' Association of Minnesota, North Dakota and South Dakota asking the members of the Hardware association to pledge themselves to use their best efforts to induce local furniture dealers to join their trade organization. Another proposed an amendment to the by-laws so as to admit implement dealers. Another proposed an amendment to the by-laws including installment houses in the list of objectionable institutions. All were referred to the Committee on Resolutions.

H. Harrington, Fargo, N. Dak., was invited to address the convention and made a brief response, preferring to have President Kelley speak for his State.

S. Zimmerman of Mankato asked for reports by the individual members of benefits derived from the association. He said that grocers in his town were handling small stocks of Hardware, and thought the interference from such quarters should be stopped.

Vice-President Stebbins stated that tinware had been a favorite source of annoying competition in the hands of grocers, but through the efforts of the association this was being stopped.

On motion of H. S. Cleveland of Minneapolis the proceedings were ordered printed and sent to the members of the association.

H. O. Amunson of Clear Lake, S. Dak., advocated a scheme of mutual insurance for the retail Hardware trade, and hoped that it would be taken up as a feature of any interstate association.

E. A. Moye of Duluth, member of the Executive Committee, asked for suggestions for future work.

S. Zimmerman of Mankato pointed out that the collection laws of Minnesota need amending. At present no bills under $10 can be collected by legal process, while property to the value of $20 is exempt. These amounts should be lowered so as to enable a class of debtors to be reached who prove very annoying. He hoped the influence of the association would be exerted to at least cut these amounts in two.

President Clark W. Kelley of the North Dakota Retail Hardware Dealers' Association was at this point invited by the chairman to address the convention. He said the North Dakota Hardwaremen had realized from the organization of their association that they could not do much alone, and so he and his associates had come down to get more help. The only way to accomplish the purposes sought is by uniting the Hardwaremen of several States, and thus bring weightier influence to bear on manufacturers and jobbers to protect the legitimate trade.

On motion of Mr. Fradenburgh of Faribault manufacturers and jobbers present were invited to enter the hall separately during the executive session shortly to be held, and address the convention.

S. M. Davis of Minneapolis read the followig paper, entitled

What Are You Going to Do About It?

Yesterday you listened to some able papers from different view points warning you against possible dangers here and there, urging you to strengthen our organization from every possible point as individual firms—a word of caution here and a call for loyalty everywhere, even at some personal sacrifice, as you shall discriminate in your purchases, favoring those houses which are proving themselves worthy of your trade.

These papers were presented to you by those who have borne the burden of the initial work of this organization. They know better than we do what progress has been made, and if in their judgment they deem it wise to proceed along similar lines another year they should have the hearty co-operation of every individual merchant.

Your enthusiastic re-election of these men yesterday calling them to service without pay for your interests, carries home to each one of you added responsibilities. We've only half the membership we should have. What are you going to do about it? Will you get every man in your town in line, or wait for the secretary to do it? There is no question regarding the issue if every dealer in the State was a loyal member of this association, and when I say loyal, it does not mean the half hearted manner in which we have supported the constitution and Executive Committee the past year. How many times have you placed your orders with a house known to be disloyal to our interests, or have passed over the matter without making the proper inquiry, thoughtless at times and almost criminal at others, making yourself and the association the laughing stock of those who antagonize us. What are you going to do about it in the coming year? Make your confession to yourself and your neighbor for conscience sake, make it as open as the erring church brother in Vermont who got up in open meeting and made the following confession :

Brethren, my conscience compels me to confess that when boiling down my sap this spring I put into the kettle two buckets of water and sold the sugar at the same price as that made from pure sap.

You gentlemen in the country can have many of your battles fought for you by the city merchants, and many of the evils confronting the dealers in the cities you can help correct, but it will demand loyalty and unselfishness on the part of both.

From expressions made by some of the country merchants I fear they do not all comprehend the far reaching and rapidly increasing menace to their legitimate trade in the mail order departments of not only the well-known catalogue houses, but every department store and installment house, all of which, whether they carry in stock or not, offer to deliver practically everything pertaining to a Hardware house unless it be the one item of Nails. What are you going to do about it? Do you patronize them when you come to the city? How will you know what jobbing house or manufacturer supplies them with their goods unless you are in touch through this organization with the city merchants and the secretary of our association?

Again, gentlemen, the manufacturers must reach you through your jobbing house. Now what manufacturers' goods do you want your jobbing house to fill your orders from? Shall it be from the very ones who sell direct to the installment houses and others above mentioned, and the identical manufacturers some of the city merchants refuse to place orders with? Verily not, if you are in loyal touch with our organization. What are you going to do about it? Why, simply decline to receive from your jobber goods manufactured by concerns who through channels already named reach in an illegitimate manner your neighbor and customer in the remotest part of the State. This need not antagonize the jobbers in the least. They know the objects of this association and many of them are in touch with and loyal to us, and we honor them for the stand they have taken. If there are any "black sheep" among them the sooner we know it the better for us and the "wosser" for them.

I am glad to know of one country dealer who was shrewd and loyal enough to decline a bill of goods for the reasons stated.

Now we want to know, must know if we are to succeed, who among such important manufacturers as those of Tin and Granite Ware are loyal to our cause, give them our support and ask our jobbers to do the same. Let the jobbers feel that you would appreciate the transfer of

their dealings to manufacturers who are loyal, and they themselves will readily see that their own interests are better conserved in this mutual protection. Give them to understand that they will be known by the company they keep, and this reminds me of a bit of pleasantry. An Irish neighbor remarked one morning :

"Patrick, you were on a bad spree yesterday."

"Yis, Mr. Ellis, I was. Bless me if I weren't a-lyin' in the gutter wid a pig. Father Ryan came along, looked at me, and says, says he, 'One is known by the company he kapes.'"

"And did you get up, Patrick?"

"No, but the pig did."

We depend upon the jobbers and we are willing to support them, and the more loyal they are to us the greater the volume of trade they may expect. The same is true of the manufacturers. If I read between the lines correctly in all your deliberations, papers and reports of yesterday, we are moving forward toward a combination of Northwestern States and ultimately to a great national organization which shall join issues with organizations of other trades and by legislation or otherwise lift up the standard of legitimate merchandising to a higher plane, bringing about just taxation, eliminating the sweat shop methods of employing girls and boys or even untutored young ladies and young men having no knowledge of their wares, who sell goods like poll parrots, making lying advertisements a crime, then verily shall three great mushrooms that stand at the three only prominent corners for trade, a menace to the peace, happiness and prosperity of all our people, be eulogized in the following language of a classic Quaker. It is related of the English ancestor of a well-known Philadelphia Quaker family that he was quite a learned man, familiar with the dead languages, and that once he went to see one of the great universities. As he was walking about there, his Quaker garb attracted the attention of three of the students, and they proposed to have some fun out of the old Quaker. They stationed themselves where he might hear them. Then one said (in Hebrew), "Here is Abraham." Another said (in Greek), "No, this is Isaac." The third said (in Latin), "No, it is Jacob." Whereupon the old man turned and said to them : "Young men, I am neither Abraham nor Isaac nor Jacob. I am Saul, the son of Kish, sent to seek my father's three asses, and, lo, I have found them."

President Kelley extended a hearty invitation to the Minnesota Hardwaremen to attend the North Dakota convention the following week.

Vice-President Stebbins stated that a bill had been introduced in the last Minnesota Legislature to punish lying advertising, but it was killed, to his surprise, probably because it came up too late in the session. If such a bill is introduced early in the next session it can probably be passed.

The convention then went into executive session for the purpose of discussing matters of a private nature. During the executive session the Committee on Resolutions reported in favor of all that had been referred to them, except the one admitting Implement dealers to membership. The question of forming a Northwestern Association was referred to the Executive Committee with power to act, and a joint meeting was immediately called at 4 o'clock in the afternoon. St. Paul was selected as the place of meeting next year, although the Duluth members extended a warm invitation to the association to visit the Zenith City on that occasion. The convention adjourned to meet in February, 1899.

Northwestern Association Formed.

A meeting of the representatives of Wisconsin, Minnesota and North Dakota was held at the Nicollet House on Thursday afternoon. After a thorough discussion of the situation it was agreed to form the Northwestern Retail Hardware Dealers' Association, to be composed of the members of the three organizations. The presidents of these organizations will constitute the Executive Committee. In view of the greater strength of the Minnesota Association, the president and secretary of that body will also be president and secretary of the joint association. The several State organizations will be continued as now constituted.

NOTES AND COMMENTS.

Charles Lindemann of J. P. Lindemann & Sons, Milwaukee, was in attendance at the convention and exhibited a lively interest in the proceedings.

C. W. Aldrich of Minneapolis, representing the Mississippi Valley Stove Company, Fulton, Ill., took much pleasure in viewing the great organization which he had materially helped to form. Thoroughly unselfish, his services were at the disposal of any one working in the interests of the association.

G. L. Nye, manager of the Minnesota Stove Company, Shakopee, Minn., mingled among the Hardwaremen to remind them that something else than wheat was produced in Minnesota.

The Peninsular Stove Company, Detroit, Mich., surpassed all their competitors in actual outlay to attract the attention of the members of the convention. They fitted up a parlor in the Nicollet House as a sample room, and displayed in it a large line of steel ranges, cast ranges, wood cooks and heating stoves. New patterns were shown, and the interest taken in the display was manifested by the almost constant stream of visitors. The exhibit was in charge of W. L. Nesbitt and C. D. Johnston, who manage between them to cover a very considerable part of the Northwest.

C. D. Pruden of the St. Paul Roofing, Cornice & Ornamental Company spent considerable time in attendance at the convention, meeting old friends and customers.

The following traveling men were observed in attendance at the convention: C. E. Cook, representing Cribben, Sexton & Co., Chicago; H. E. Cook, Eclipse Stove Company, Mansfield, Ohio; F. E. Muzzy, I. C. Montgomery and F. J. Norvell, Simmons Hardware Company, St. Louis; W. S. Wood and J. F. Sigloch, Marshall-Wells Hardware Company, Duluth; C. S. Howard, J. P. Lindemann & Sons, Milwaukee; W. H. Kirk, Cleveland Foundry Company, Cleveland; J. N. Boyd, Belleville Stove Works, Belleville, Ill.; G. L. Horton, H. P. Gallup and N. Geib, Farwell, Ozmun, Kirk & Co., St. Paul; W. J. Moorhead, Hibbard, Spencer, Bartlett & Co., Chicago; F. W. Lucas, Bergstrom Bros. & Co., Neenah, Wis.; R. A. Grim, Michigan Stove Company, Chicago; C. H. Conner, Fuller-Warren Company, Milwaukee.

Indiana Retail Hardware Dealers' Association.

The following call has been issued for the annual meeting of the Indiana Retail Hardware Dealers' Association at South Bend on Wednesday and Thursday, 23d and 24th inst., by M. L. Lewis, secretary, Marion, Ind.:

MARION, IND., February 7, 1898.

Believing that all retail Hardwaremen should be interested in our association for their own welfare, and that the time is now when we should unite, get together and correct at least some of the evils connected with the retail trade, we extend a cordial invitation to you to attend our annual meeting in South Bend, on February 23 and 24.

Send your application at once to the secretary, or join us at the meeting.

This call, it will be observed, is addressed to parties not members of the association, whose co operation in its work is earnestly desired. It is to be hoped that a large accession to the membership will be recorded at the meeting, and that thus the objects which it is seeking to accomplish may be realized.

George William Hoffman, Indianapolis, Ind., manufacturer of Metal Polishes, advises that business in that line has been and is very good, and that the demand is very flattering.

The Ohio Hardware Association.

This association, which is vigorously prosecuting its work, is officered as follows : J. P. Duffy, Greenville, president ; M. B. Talmage, Mount Gilead, vice-president, and John F. Baker, Dayton, secretary-treasurer. The following call to the annual meeting, February 23 and 24, has been issued by the efficient secretary-treasurer :

DAYTON, OHIO, February 10, 1898.

The Ohio Hardware Association will hold its fourth annual session at Columbus, Wednesday and Thursday, February 23 and 24, 1898. The meetings of the association will be held in the spacious assembly hall of the Hotel Chittenden, the session of Wednesday beginning at 2 p.m. and that of Thursday at 9 a.m. The Executive Committee have prepared a programme, which they believe will be of great interest to those who attend the sessions. A number of papers relating to matters of vital importance to the trade will be read by members of the association during the session on Wednesday. On Thursday the session will be devoted to the "question box," and business ideas, methods and management will be discussed.

The committee look forward to the coming meeting as one of the most important in the history of the association, as the papers to be read will be of great interest, and the new feature just introduced—viz., the question box—will provoke inquiries and discussions that must prove helpful to every dealer in our State. The social features have not been overlooked. In the evening of Wednesday occurs the annual banquet, at which some of the veteran Hardware dealers of the State have consented to address us. On Thursday evening we are to be the guests of the Columbus Wholesale and Retail Hardware Association.

A very earnest and cordial invitation is extended to the Hardware dealers of Ohio to meet with us at Columbus, as well as to become members of the association. The need of an association is apparent to all. The Hardware trade throughout the Union is organizing. Several of our sister States have associations that are now a power for good.

There are about 1100 Hardware dealers in Ohio. If all or the majority, were members of our association the abuses and evils that have crept into the trade could be overcome, but this cannot be accomplished except by an organized effort and organizations to be effective must be complete.

The Executive Committee has taken especial pains in arranging the programme for the Columbus meeting, and in securing a large attendance not only of the many prominent Hardware houses identified with the association, but of others in all parts of the State, who have been invited to join the movement. All the indications point to an exceptionally large and successful gathering.

MEMORANDA.

Keen & Hagerty, Baltimore, Md., find the year opening with excellent prospects for their business. They are meeting with a very gratifying demand for their Tinware, Enameled Ware and other products, and their factory is kept busy in all its departments. The firm's New York City manager, A. W. Pritchett, whose office and show rooms are at 101 Beekman street, reports a great run on the S. & B. Galvanized Tubs, which were illustrated and described in these columns when first placed on the market last year. Among the new goods which the firm are manufacturing this year and which are attracting much interest in the trade are Champion Sieves, made in two sizes. Other new goods are in course of preparation and considerable additions are being made to the firm's line of Enameled Ware.

The Griswold Mfg. Company, Erie, Pa., issue their 1898 catalogue in the interests of their well-known Erie Cast Aluminum and Iron Hollow Ware and other goods. It is a very tastefully published volume of 80 pages, in dark green covers decorated with silver lettering and their trade-mark, being the thirteenth annual catalogue issued by this concern, who started in 1868 with a small plant of 5000 square feet that has been increased until at present the floor space amounts to 100,000 square feet. In an introductory note they refer to the merits of the Erie Ware, American Dampers, American Waffle Irons, &c., and point to the great success of their Erie Cast Aluminum Ware, which is made from the best No. 1 aluminum metal. They also refer to Iron Hollow Ware, Gas Ranges, Hot Plates, Heaters, &c., of which they will send a special catalogue to any one who wishes it. In addition to their regular line of goods this firm are prepared to make special aluminum castings of any size and description practical to mold, also fine light gray iron castings. All the goods in the line indicated are illustrated and described with price lists, and at the end is an alphabetical index. The printing is done in a greenish ink, which gives a handsome effect.

A 32-page catalogue is received from Patterson, Gottfried & Hunter, Limited, 146-150 Centre street, New York, devoted to Rubber Goods, including Belting, Hose, Hose Trimmings, Tubing, Packing, Gaskets, Balls, Diaphragms, Car Springs, Wagon Springs, Stair Treads, Mats, Matting, Blankets, Rollers and Wheels. It also shows Shaft Hangers, Collars and Couplings.

The Pike Mfg. Company, 151 Chambers street, New York, are now handling a large line of Domestic Pumice, both brick and ground. It can be had in square bricklets and ovals for toilet use or in bricks 5 x 3 x 2¼ inches. The powdered varieties are put up in 1 and 5 pound packages and in barrels. It is regularly made in 12 degrees of fineness, but any sample of Pumice submitted can be matched. This Pumice is a purely American article, and is offered in competition with the foreign article.

J. A. Hutchings, Kokomo, Ind., dealer in Hardware, Stoves, Tinware, Paints, Bicycles and Sporting Goods, is enlarging his storeroom and also his show windows. A 16-foot plate glass floor showcase is also being installed, as well as raised platforms for the display and accommodation of Bicycles. Other improvements in progress are a new office and vault, which will be in the front of the store.

Andersen & Fritz are successors to S. E. Andersen in the Hardware, Tinware and Stove business in Racine, Wis.

Enameled Trade Specialties.

Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, have added a number of specialties to their large line of enameled goods, some of which are here illustrated. Fig. 1 represents a combination double sauce-

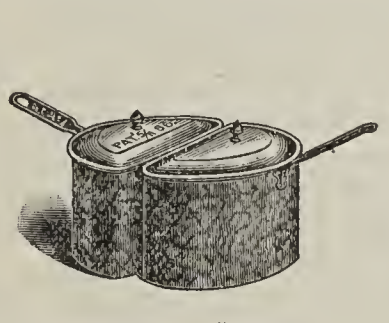


Fig. 1.—Double Saucepan.



Fig. 2.—Triple Saucepan.

pan, each utensil having a capacity of 5 pints. Fig. 2 is an engraving of a combination triple saucepan, each vessel holding 6 pints. They are for use on gas and oil stoves or where economy of space is necessary. They are made only in crystal steel enamel, the body of which is of a grayish color, slightly tinged with olive, presenting a

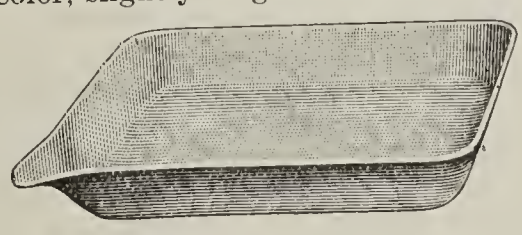


Fig. 3.—Lipped Photographers' Tray.

wave like appearance. Fig. 3 is a view of a photographers' lipped tray for developing purposes. This tray is made in both shallow and deep patterns, each in five sizes —viz., 5 x 7, 7 x 9, 8 x 10, 10 x 12 and 11 x 14 inches measured at the bottom of tray. Fig. 4 shows the form of a chemists' round evaporating dish made in ten numbers varying in diameter from 5 to 26 inches, with capacities

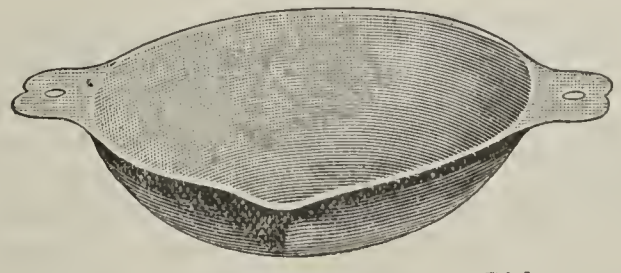


Fig. 4.—Chemists' Evaporating Dish.

from ½ to 28 quarts. The photographers' trays and evaporating dishes are made in flint enamel only, to withstand the action of powerful acids, and are designed for laboratory use.

STOVE TRADE NOTES.

Should Makers Retail?

BY I. N. J.

The question, Should makers retail? is periodically presented to the trade. Sometimes it is in reference to house heating boilers, at other times in reference to stoves and ranges, and again hot air furnaces. Some men engage in the manufacture of boilers so that the goods which they install may be produced at a lower figure, and that they may make a profit both on the manufacture of the goods and in the installation of them. In the sale of stoves and ranges many manufacturers only retail when it is apparent that the responsibilities of the sale cease immediately when the goods are delivered to the owner or to the transportation company. Manufacturers of furnaces, where retailing is done, usually confine themselves to a very limited territory.

Those who are in the same line of business and who do not wish to incur the responsibility of running a shop and employing a corps of workmen hold to the idea that the manufacturer should not engage in competition with the mechanic or artisan who contracts with the consumer. Those who wish to extend their trade on a purely wholesale basis point out that it is unjust to the retail trade for any manufacturing house to compete in the same market, or in fact any market, for the favors of the consumer. Makers who do a profitable business and refrain from retailing altogether present the opinion that if all the trade confined themselves to wholesaling alone just as many goods would be made and sold and the retail trade would place their orders where they had received good business treatment. These wholesalers find many in the retail trade, particularly in the territories where the manufacturers enter into competition with them, who hold the same idea in reference to manufacturers retailing. Some who are in the retail business will not, if they can avoid it, buy goods from houses who do both a retail and a wholesale trade.

In support of the argument that the manufacturers should not sell direct, numerous instances are pointed out where after the manufacturers had secured a good wholesale trade in sections of the country where retailing could not be profitably done they have discontinued their retail business in the locality of their manufacturing plant. It would doubtless be very gratifying to the retailers if all manufacturers would follow such a course. On the other hand, the manufacturer who wants to introduce his goods and to have them give the best results, so that his sales may increase, is very careful in selling them and secures prices that will allow the very best system to be used and employ the best workmanship and materials. If the introduction was left to the trade, with the sharp competition existing, it is argued that the goods would be very slow in making their way.

New Designs in Stoves.

The Western stove manufacturers are making preparations to take advantage of the improving outlook for business. More new goods seem to be contemplated this spring than has been the case for a long time. Hardly a manufacturer can be found who does not speak of new patterns which he hopes to have on the market very shortly. In the next month or two our columns may be expected to contain numerous announcements of this character. The change in this respect is quite marked. Manufacturers who have in past years talked very indifferently about new designs, and expressed themselves satisfied if they could do a fair business in their old goods, taking the position that they saw no inducement to go to much expense for novelties or changes, are now hard at work on something which they believe will catch the trade. The revival of confidence in a considerable enlargement of business this year has thus given birth to new inspirations which augur well for this year. While it is not given to any mortal to see far into the future, the indications are certainly in favor of a great improvement in 1898 over the past two or three years, and we hope that the buoyant anticipations now being indulged may be realized to their utmost extent.

Electricity vs. Gas for Cooking and Heating.

Before the members of the Northern Society of Electrical Engineers, at a meeting held in Manchester, England, W. P. Adams read a paper entitled "A Survey of the Possibilities of Electric Heating and Cooking." He said the advantages claimed for electrical heating and cooking appliances were that they were more economical in point of heat utilized than any other appliances, that they were quite without equal in point of cleanliness and general convenience, that by their use absolutely uniform results could be obtained, and that they were free from such dangers as attend the use of gas cookers, explosions being impossible, and the risk of fire *nil*. As to electric heating, he expressed the opinion that the day was not far removed when more current would be used for that purpose than for lighting. If electricity were supplied for heating purposes, at little more than the bare cost, the suppliers would very soon find that the improved conditions under which they ran their plant would repay them handsomely. Several of the supply companies had adopted the policy of charging for power and heating purposes a price which was actually less than the total works cost, and he regarded this as an enlightened policy, in view of the fact that, assuming the plant used for lighting was employed also for heating purposes, the charge for rent, management, &c., would remain practically the same. The chief difficulties in the way of electric cooking were the rather high first cost of the apparatus and the cost of the current. A common figure for the current used for this purpose at the present time was 3 pence per unit. The ideal to be aimed at was 1 penny per unit. Although it was only possible at present for one or two companies to charge such a figure and cover the bare cost of production, he thought that with a rapidly growing load on supply stations it would soon become general. On the question of the comparative costs of cooking by electricity and gas he said he had obtained figures from a kitchen in which both gas and electricity could be used at will. The household was a small one, consisting of about five persons, and the consumption of electricity was, approximately, 30 units per week when cooking was done solely by this agency. When gas was employed exclusively 1240 cubic feet were used during a week. The cost of the electricity, at 2 pence per unit, was 5 shillings per week, while the cost of the equivalent amount of gas, at 3 shillings per 1000 cubic feet, was 3 shillings 9 pence. Other results which had reached him indicated that the consumption of current might be reduced below the figure given when the appliances were used intelligently and with care. For a small installation, such as that referred to, it might be assumed that a unit per head per diem would suffice for all cooking purposes. This figure would naturally be reduced in larger establishments. The best results would be obtained where there was a slow combustion stove fitted up for the supply of hot water, as the heating of water by electricity was a most uneconomical proceeding, at any rate at present prices. For reasons such as he had indicated, he thought the supply of cooking and heating appliances should be vigorously pushed.

Commenting on Mr. Adams' paper a correspondent of the London *Gas World* writes: "As a member of a firm who are manufacturers of electrical heating appliances, and naturally interested in their success, I feel sure that such statements as those of Mr. Adams can only injure and discredit an industry which fills well a certain limited place. In the infancy of the gas heating appliance trade the same method of exaggeration was carried on, but not to a tithe of the extent. Such as it was, it discredited the whole industry and created an army of unbelievers who

acted as a drag on it for many years. It is to be hoped that history will not repeat itself as regards electrical heating.

"I believe that 1 electrical unit is equal to 1000 watt hours or 3440 British thermal units, which latter is equal to the heating power of 5 cubic feet of coal gas. One thousand six hundred and twenty thermal units will, in theory, raise 1 gallon of water from 50 to 212 degrees F.; in practice, with gas, in small kettles, double this is required. Taking gas at 2 shillings 10 pence per 1000 cubic feet, the cost of this is 1 penny for 6 gallons If all the electrical energy is used, and no waste occurs (a practical impossibility), at the usual 5 pence per Board of Trade unit, it will cost 1 shilling 3 pence to boil 6 gallons of water. It would appear that Mr. Adams ignores the water heating in the electrical arrangement, as the total current expended would not heat half the water required, to say nothing of any cooking. Allowing for one-half the gas being wasted, 300 cubic feet would do the same work as the 5 shillings' worth of electricity (at 2 pence per unit) if none of the latter is wasted, which is impossible; and in addition to the 150 cubic feet of gas allowed for waste, another 940 cubic feet must have been thrown away if Mr. Adams' figures are correct. It would be interesting to know the retail cost of a complete electrical cooking apparatus which would do the work of the gas cooking ranges hired out by the gas companies at a few shillings per annum, say one capable of cooking a complete dinner for ten persons; also the average cost per annum for repairs and renewals, and who is to pay for these."

ODD PLATES.

A new circular is just issued by the Leibrandt & McDowell Stove Company, Philadelphia and Baltimore, showing half-tone engravings of their Loyal Victor Range, which is made in 48 styles and sizes. A feature of the construction is the arrangement by which all the oven plates and internal parts may be removed without taking down the body of the Range. The circular gives full particulars and prices. E. D. Purves is making it the basis for a special tour among the trade.

The Kernan Furnace Company, Utica, N. Y., inform us that they have heated the Universalist Church, at Salisbury Centre, N. Y., with one of their Union Furnaces and that the heating during the recent cold weather was thoroughly satisfactory.

The Bonnet & Nance Stove Company, Quincy, Ill., are reported to have sold the remaining portion of their plant, which was partly destroyed by fire some time since, to the Excelsior Stove & Repair Company. The latter company increased their capital stock from $20,000 to $60,000, to cover their enlarged operations. The Bonnet & Nance Company, it is said, will remove to the vicinity of Chicago and erect a new Stove foundry.

J. Kisterback & Son, Philadelphia, have moved from their former location, 1231 Market street, to more commodious premises, 2002-2004 on the same street. The new location presents excellent manufacturing facilities and allows besides of over 6000 square feet of floor space being available for a display of their well-known Heaters and Ranges, and also of Gas Heating and Cooking Apparatus, Tile Hearths and other goods. T. J. Leary has charge of the business.

H. P. Gingrich, representing the Quick Meal Stove Company, St. Louis, has just returned from a Southern trip. He reports business in a prosperous condition and finds buyers more disposed to purchase liberally than they have been for several years past.

A recent number of the Taunton *Evening Herald* contains portraits, with brief biographies, of prominent city officials of that place. Among them is a notice of George L. Walker, who is treasurer of the Century Stove Company of Dighton. Mr. Walker was born in Dighton, and in 1864, when but 16 years of age, he enlisted for the war, but peace being declared the following year he returned to his native town and took up the trade of carpentering, which he followed for several years, and then turned his attention to pattern making. Subsequently he began the manufacture of Stoves, in which his energy and ability brought him success. In 1894 Mr. Walker was elected to the Board of Aldermen and again in the last campaign.

Charles E. Coleman, Western manager for Eugene Munsell & Co , 117-119 Lake street, Chicago, Ill , has just returned from an Eastern trip, during which he spent a few days with his friends in and about New York City. Munsell & Co. are carrying a large stock of fine quality Mica, both at their Chicago branch and at the home office, 210 Water street, New York City, and are in a position to make prompt delivery of any size on the list.

At the recent annual meeting of the stockholders of the Grander Stove Company of Royerford, Pa., W. S. Price was elected president, John U. Isett vice-president and J. M. 'Lewin treasurer. These officers, with John Flint and Washington Smith, constitute the Board of Directors. After the election the annual banquet was held.

Roberts, Winner & Co. of Quakertown, Pa., after a shut down of two months, are now operating their works four days a week.

The Howard Thermostat Company, 111-115 Water street, Oswego, N. Y., are distributing a small folder illustrating and describing the Howard Automatic Draft Regulator, intended for use on Hot Air Furnaces, Hot Water Heaters, Steam Boilers, Stoves and Incubators. The thermostatic plaque is placed on the wall of a living room and operates solely by power obtained by the contraction and expansion of metals. By means of connections over pulleys which extend down inside the partition to the heater room, it automatically operates the damper connected to the smoke pipe and gives an even temperature. The company are distributing this little folder to all those whom they think are likely to be interested in such a device.

The Deer Lick Oil Stove Company of Chagrin Falls, Ohio, have been incorporated, with a capital of $20,000, by C. S. Bentley, M. M. Norton and L. B. Beers.

The Cincinnati Stove & Repair Company have been incorporated at Cincinnati, Ohio, with a capital stock of $5000.

A. Weiskittel & Son, Baltimore, Md., are getting out a new catalogue of gas cooking and heating appliances and will have the same ready for distribution to the trade very shortly.

Through a misunderstanding of a pronoun we made a statement in the issue of *The Metal Worker* of January 22 relating to the Toledo Stove Company which was exactly contrary to the facts. The announcement as furnished us by that company was to the effect that the Toledo Stove Company, Toledo, Ohio, had just closed a contract for the year 1898 with the Chicago Stove & Range Company, Chicago, Ill., to handle the Toledo Stove Company's Stoves and Ranges in territory west of Chicago. This contract is a *bona-fide* sale of the goods, and guarantees a purchase of a stipulated amount in cash during the year and at very favorable terms.

The sixty-fourth semi-annual meeting of the Detroit Stove Company was held in Detroit, Mich., on the morning of Tuesday, February 8, when William Tefft Barbour was elected president, William G. Henry vice-president, G. Bert Gunderson secretary and treasurer and Lafayette Crowley superintendent. The officers named, together with E. T. Barbour and M. B. Mills, constitute the Board of Directors. The reports of the officers showed that the business of the company last year was the largest in their history.

The Indianapolis Stove Company of Indianapolis, Ind., now have their new plant in full operation. The spring trade is said to be opening up well and the outlook for business is most encouraging.

The foundry of the Marcy Stove Repair Company, located at Perth Amboy, N. J., was burned Thursday morning, entailing a loss said to be about $15,000. The buildings destroyed include the foundry and the carpenter shop, but the pattern building, which is a fire proof one, was saved, so work can be begun as soon as new buildings can be put up. In the meantime the company will make arrangements to place some of their molders in another foundry and continue to fill orders as usual.

Col. James A. Sexton of the firm of Cribben, Sexton & Co., Chicago, Ill., has sold his interest in the business to his partners and retired from the firm. He had been in active business 31 years, and his retirement is due to inflammatory rheumatism, from which he is now suffering. Colonel Sexton has not only been prominent in the Stove trade but in army and political circles as well. He was Postmaster of Chicago for four years, resigning in March, 1892, though he did not leave the office until the following winter, owing to delays in appointing his sucessor.

The alterations in the plant of Excelsior Steel Furnace Company, at 38 West Monroe street, Chicago, are practically completed, and the manufacturing and warehouse floors present a changed appearance. Five new presses have been installed. and over 400 new dies addded to those previously in use. Many special tools, largely the product of the foundry and machine shop of the company, have been placed in position for the manufacture of the new line of double safety Wall Pipe which they are about to place on the market. The bins and compartments for warehousing the new goods are in readiness and are being rapidly filled. The sample room for the display of the numerous productions of the company has been repainted and rearranged, and is ready for visitors when the spring trade opens. The space devoted to the shipping department has been enlarged in anticipation of an increase in business this season.

Application has been made to the Dominion Parliament for the incorporation of the Burrow, Stewart & Milne Company, Hamilton, Ontario, to manufacture stoves and implements. Capital $150,000.

TRADE REPORT.

METAL MARKET.

Pig Tin.—The advance in wholesale prices last week has been followed by a further movement upward during the week under review to the extent of about 15 to 20 points. Purely speculative operations have failed to materialize, despite the advance of the past two weeks and the heavy transactions reported from London, but purchases for regular trade account and for consumption continued fairly large. Spot stocks have been cut into, since only about 200 tons have been received this month. There are 2600 tons afloat for this country, including 850 tons shipped from Europe, but this circumstance has had no perceptible influence upon the market. Jobbers' prices for small lots from store, while firm, are unchanged at 14½c. to 15c. per lb. for Straits Pig.

Copper.—There has been an advance of ⅛c. to ¼c. in the wholesale prices of Ingot, and the market is decidedly firm. The continued heavy export movement, which, along with home trade deliveries, has kept the supplies available for early delivery down to an unusually low point in the face of heavy production, is largely accountable for the advance. The domestic demand is of fairly large volume, both in wholesale and retail lines. Dealers' quotations for small lots are very firm at 12¼c. per lb. for Lake Ingot, while Ansonia Grade Casting Copper has been advanced ¼c. to 11½c. per lb.

John Stanton reports the Copper production in the United States and of the foreign reporting mines and United States exports as follows, in gross tons of 2240 pounds :

	Reporting mines.	Outside sources.	Total U. S. product.	Product foreign mines.	U. S. exports.
First half 1895....	70,612	9,100	79,712	42,484	34,215
Second half 1895..	84,885	6,600	91,485	43,674	30,507
Total 1895...	155,497	15,700	171,197	86,178	64,722
First half 1896....	94,180	7,200	101,380	42,255	58,216
Second half 1896..	95,314	7,200	102,514	43,941	67,287
Total 1896.....	199,494	14,400	203,894	86,196	125,503
First half 1897....	103,651	5,000	108,651	44,263	64,870
Second half 1897..	100,555	6,900	107,455	44,007	64,340
Total 1897.....	204,206	11,900	216,106	88,270	129,210
January, 1898.....	16,544	1,200	17,744	5,556	11,030

Sheet Copper.—The advance in raw material has been accompanied by increased inquiry for manufactured Copper during the week. Although orders for Sheet Copper are still generally confined to the filling of immediate needs, they are being received in more liberal volume, showing that the consumption is expanding. Manufacturers are preparing for a large expansion of the demand in the near future and regard the outlook in this department as very promising. While dealers' quotations still vary, the leading houses are holding Sheet Copper in retail quantities firm at about 15c. per lb., basis.

Lead.—Buying by jobbers and for consumption has been more free and the market, supported by the "bullish" element, is decidedly stronger, wholesale prices showing an advance of about 1-10c. in the pound over a week ago. But little large business was done, however, buying being limited largely to moderate quantities for present use. Small lots of American Pig from store sell at 4⅛c. to 4.20c. per lb.

St. Louis advices report no special change in this metal, sales being limited in volume.

Lead Pipe and Sheet.—These materials are still selling rather slowly, as is natural at this season, but the feeling among dealers is more cheerful as regards the outlook. A great deal of building is in prospect for the present year, which should stimulate the demand for plumbers' materials. Jobbers in this section quote Pipe at 5½c. and Sheet at 6½c. per lb., subject to the usual trade discount of 20 per cent.

Spelter.—There has been a further fractional advance in wholesale prices and the market displays a very firm front, yet the demand does not appear to have increased to any important extent. The basis of the advance is rather due to limited offerings from primary sources. Good Western brands in retail quantities are quoted at about 4½c. per lb.

St. Louis advices are as follows: The market remains practically unchanged. Consumers are not disposed to anticipate their wants, and confine their purchases to small lots for their immediate wants.

Sheet Zinc.—Sales are of a routine character and the demand is merely moderate. Prices have not varied, jobbers quoting 600-lb. cask lots at 5⅝c. to 5¾c. per lb., and smaller quantities at 6⅛c. to 6¼c. per lb.

Antimony.—Business is moderate, but prices are very firm, the cheaper grades having been advanced about ¼c. In small parcels from store Japanese is quoted at about 7½c. per lb., Hallett's at 7¾c. to 8c. and Cookson's at 8½c.

Nickel.—The price for small lots has not varied from 38c. per lb.

Aluminum.—The demand for this metal is referred to as good. Prices are as follows: No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb.; 100-lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb.; 100-lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb.; 100-lb. lots, 30c.

Tin Plate.—No improvement has been developed either in the demand or in prices, which remain at their former low level. American Plates have been selling slowly, neither consumers nor sellers showing much interest. The former find further cause for delaying the placing of their orders in recent news regarding the effort to pool or combine the manufacturers. It is understood that a number of difficulties are being met with by the committee working on the combination scheme, foremost among which is the independent attitude of one of the largest concerns in the business. Nevertheless the committee are still earnestly at work, and those most interested in the proposed consolidation are by no means discouraged as to its ultimate success. The negotiations, which seemingly failed in New York, have been resumed further West. It should be borne in mind that the completion of such a comprehensive and important plan as is contemplated must involve long and patient effort. The committee having it in charge, after formulating their report, will have to submit it to their principals, the manufacturers, for their indorsement, before any definite steps can be taken in the premises. Then will come the matter of arranging terms with the 40 or so firms in the industry, involving further negotiations, all of which will consume an indefinite amount of time. Meanwhile, the consumers will be forced to come into the market in order to secure their absolutey needed supplies, and if there should be a sudden rush of orders there is every likelihood of at least a temporary shortage, for stocks are understood to be by no means excessive. In this event higher prices would result. At present prices are as low as they ever were. The retail business has been fairly good, but hardy as large in the aggregate as it was last month. The recent severe wether has no doubt had its effect on small orders. Jobbers' prices show no quotable change. Small lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are quoted about as follows, but there is a good deal of cutting under these rates: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates remain dull and prices are largely nominal.

Chicago advices are as follows: Jobbers report a little better movement in Tin Plates. The spring trade seems to be opening up in this branch, and the demand is expected to show growth from this time forward.

Sheet Iron.—There has been quite a good demand from the mills for best Sheets, and the mills are running full with considerable work in hand. Common Sheets have been pressed for sale at low prices, but buyers discriminate closely and appear willing to pay the price for the right kind of stock Orders placed for both Black and Galvanized Sheets have been quite heavy and the outlook for the first half of the year is quite promising. Several mills have recently booked some large contracts for the second quarter. Prices, as a whole, are well maintained. Jobbers in this quarter report a very moderate business. Small lots from stock are quoted at about 2.40c. for No. 27 Common Black Sheets and 75 and 10 and 5 per cent. off for Galvanized.

Chicago advices are as follows: Black Sheets are not so active, but heavy orders are being placed for Galvanized. Galvanized Sheets are firmer, more business being now taken at prices which buyers considered too

high at the beginning of the month. Jobbers quote small lots of Black Sheets from stock at 2.30c. to 2.40c., and Galvanized Sheets at 80 and 2½ to 80 and 5 per cent. off.

Old Metals.—The market is very firm, with a good demand for almost all lines of old metals, both for home consumption and for export. Scrap Brass and Copper are specially active at full prices, and low priced Scrap Iron is moving very freely. Yard dealers in this city and vicinity are paying about the following rates for moderate sized lots, delivered here:

Heavy Copper	per lb. 9⅜c.
Light and Tinned Copper	per lb. 8⅛c.
Heavy Brass	per lb. 6¼c.
Light Brass	per lb. 5¼c.
Lead	per lb. 3⅜c.
Tea Lead	per lb. 3⅛c.
Zinc	per lb. 2¾c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$8 25
Heavy Cast Scrap, per gross ton	8.25
Stove Plate Scrap, per gross ton	5.75
Burnt Iron, per gross ton	4.25
Tin Plate Scrap, per ton	3.75

THE IRON MARKET.

Bessemer Pig in the Central West has been quiet and steady. There has been no evidence of further purchases by large consumers, and for the present the views of sellers and buyers are apart.

In Foundry Iron the markets are still irregular. The Southern makers are holding a meeting to day at Birmingham with the aim to graduate from the discredited "gentleman's agreement" to a more effective organization, in which all sales are to be handled by a commissioner. The attitude of some of the interests does not encourage much hope for success.

The Iron Age's monthly blast furnace statistics show a moderate increase in active capacity, and an increase in stocks. in which nearly all sections participate, of about 40,000 tons for the month of January.

The engineers who have been appraising the plants included in the Wire consolidation have practically completed their work, and it is understood place the valuations close to those set by the owners upon their property. This is interpreted as being favorable to the success of the plan. Practically all the preliminary work is now done and the final negotiations are progressing, so that possibly next week may bring the announcement of their consummation. There may be some delay, however, since the leader of the financial syndicate is absent.

Pig Iron.—In the New York market sellers report a fair volume of business, but prices remain in an unsatisfactory condition. The Birmingham producers are in session today, continuing their efforts to get the industry into better shape. The plan now under consideration is to handle all the sales through a commissioner. We quote as follows: Northern brands, No. 1, $11.75 to $12; No. 2, $10.75 to $11.25; No. 2 Plain, $10.50 to $10.75. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.75; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

The feeling in the Philadelphia Pig Iron market is very unsettled. The demand has not met expectations, and as requests for postponements of deliveries are becoming unpleasantly frequent holders are disposed to push sales so as to avoid accumulations at furnaces. Buyers are very timid, however, so that not much progress is being made in sales, while prices are gradually drifting toward a lower level. It is hoped that an improvement in the demand will be met with in the near future. It is difficult to give exact quotations, as each seller seems to have a price of his own, regardless of what others may do. A fair average of asking prices for seaboard deliveries would be about as follows, with usual rebate according to freights at points within a radius of 100 miles south or west: No. 1 X Foundry, $11.75 to $12; No. 2 X Foundry, $10.75 to $11; No. 2 Plain, $10.50 to $10.60.

The situation in Pig Iron in Chicago is peculiar. A very good inquiry is being received for all kinds of Iron, and with the heavy orders now on the books of furnace companies prices ought to be well maintained. The volume of business has been large since early in December. The local furnace companies and Southern sales agents have been well favored with orders, but at the present time the market is weak owing entirely to the attitude of some of the Southern producers. The local companies are making some sales, but refuse to meet the prices quoted by the Southern producers, believing they will not have long to wait until the weak sellers are loaded. The local manufacturers report in fact that they have some difficulty in arranging for deliveries, owing to the condition of their order books. Notwithstanding the cutting of Southern prices, the situation in the main is considered fairly satisfactory. We quote for cash as follows:

Lake Superior Charcoal	$11.50 to $13.00
Local Coke Foundry, No 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.35 to 10.60
Southern Coke, No. 3	10.10 to 10.30
Southern, No. 1 Soft	10.85 to 11.00
Southern, No. 2 Soft	10.35 to 10.60

Pittsburgh reports indicate that there is practically nothing doing in Bessemer Pig there, but the market is very firm. As to the future of the market opinion is divided. The consumption of Iron promises to be much heavier this year than ever before, and this, in connection with the advance of 15c. in Ores agreed upon, leads well informed authorities to believe that the present market will be sustained and that higher prices are likely. On the other hand, it is claimed that there is an overproduction of Pig and a shortage in converting capacity, and that prices of Bessemer will be low until production is restricted. Foundry Irons are dull. We quote, f.o.b. Pittsburgh: No. 1 Foundry, $10.40 to $10.50; No. 2 Foundry, $9.90 to $10; Bessemer, $10.15 to $10.40, depending on delivery.

The St. Louis Pig Iron market continues to be quite active, but there is no change to note in prices. The market is hardly in shape to stand any advance, and none is likely to be made. Sales during the past week have been heavy, and the prices quoted below are the basis on which these sales were made. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.25 to $10.75
Southern, No. 2 Foundry	10.00 to 10.25
Southern, No. 3 Foundry	9.75 to 10.00
No. 1 Soft	10.00 to 10.25
No. 2 Soft	9.75 to 10.00

CHICAGO REPORT.

Scrap.—All kinds of Old Material are in strong demand, especially Cast Scrap. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	7.50	....
Malleable Cast	6.50	...
Stove Plate (free of burnt)	5.50	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9½c.
Copper Bottoms	....	8¾c.
Copper Clips	....	9¼c.
Red Brass	....	8 c.
Yellow Brass	....	6¾c.
Light Brass	....	4½c.
Pipe Lead	....	3.10c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—The movement is again very light and prices are lower. The ruling prices of carload lots of 12 tons minimum are as follows:

	Grate.	Egg, Sto and Ch.
Chicago, Ill	$4.75	$5.00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	6.75	7.00
Council Bluffs, Iowa	6.75	7.00
Lincoln, Neb	6 90	7.15
Sioux City, Iowa	7.25	7.50
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	6.75	7.00
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	6.75	7.00
Leavenworth, Kan.	6.75	7.00
Omaha, Neb	6.75	7.00

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

Trade is gradually improving, but apparently awaits, in the East at least, further progress of the season before assuming full proportions. The kind of weather which has prevailed in different sections has also had a repressing effect on business. It is, however, almost the universal report of both manufacturers and jobbers that last month showed a substantial increase in the volume of its transactions over January of a year ago. Goods generally continue on the same level of prices as heretofore and the tone of the market on most lines is not especially strong. Some goods under special influences are a little firmer and, in some cases, quotably higher, but as a rule manufacturers are not able to advance prices as yet, awaiting the coming of more favorable conditions and a marked increase in the volume of trade, prices of the raw material or cost of manufacture. Notwithstanding the fact that prices are in most lines very close, yielding but a small margin of profit, manufacturers are very desirous of securing orders, and in some instances are making slight concessions to this end. There continues to be an active movement of goods to foreign markets, large quantities of Nails and Barb Wire being exported. There are also indications of increased enterprise on the part of manufacturers to secure this class of business, and the number of lines which can advantageously be sold abroad is constantly enlarging. The manner in which the volume of general business is expanding is a very favorable sign, leaving no doubt that there is throughout the country a better and a still improving condition of things.

Advices from Chicago.—Shelf Hardware jobbers report a satisfactory trade in most sections, but with considerable interruption in others owing to the annual mud blockade. This feature of the West and Northwest may now be expected to figure more or less prominently in trade reports for several weeks. Alternations of freezing weather with thaws will keep the roads in very bad shape. Wherever trade is not affected by these conditions the demand is excellent, and salesmen report very encouraging prospects. Orders for future delivery on spring and summer goods are being steadily placed, and the demand for staple goods is on the increase as usual at this season. New stocks of Hardware are still being bought, several having been filled in this market during the past week. Jobbers of Heavy Hardware also take a very cheerful view of the situation, reporting their February business much in excess of that of February last year.

Advices from St. Louis.—The movement in Shelf Goods continues to increase, and a heavy trade is the general report from all jobbers. Builders' Hardware is in excellent demand, but orders largely call for the cheaper grades. Galvanized Iron is active at 80 and 5 per cent. discount. Tin Plates and Black Sheets are also free sellers just now. The demand for Mining Tools and Supplies for the Alaska trade is heavy, and jobbers are issuing special circulars containing description and prices of goods adapted to this trade. This department gives promise of becoming a very important one as the season advances. Traveling men are sending in good orders, and refer to the bright prospects for a heavy spring trade. Collections are satisfactory.

NOTES ON PRICES.

Wire Nails.—There continues to be a good demand for Wire Nails, trade being stimulated by the higher prices now ruling and the prospect of a further advance. The approach of spring has also something to do with the increased demand. The tone of the market is decidedly firm, and these prices are well maintained. The New York price for small lots from store is $1.70 to $1.75.

Advices from Chicago.—Heavy shipments are being made by manufacturers on old orders and some fresh inquiries are being received, but, on the whole, new business is rather quiet. Jobbers are undoubtedly well covered for the remainder of February, and will wait a little longer before placing contracts for March at the advance of 5 cents which is asked. Meanwhile it is also probable that the consolidation scheme will be definitely settled one way or another. Manufacturers are confident that it will go through as outlined in the announcements hitherto made by interested parties. Jobbers report their trade growing better. An improvement in their shipments has been noted regularly for the past four weeks. They quote small lots from stock gradually firming up to $1.65, which is the difference made by manufacturers on small lots.

Advices from St. Louis.—The market is very firm and mills report a heavy trade. The combination of the Wire interests is now generally accepted as practically accomplished, and dealers are increasing their orders in consequence. Jobbers report an increasing trade and quote $1.65 to $1.70, base, for lots from store.

Cut Nails.—The Cut Nail market is not characterized by as firm a tone as Wire Nails, but prices are, on the whole, quite well maintained. Small lots from store, New York, are quoted at $1.30.

Advices from Chicago.—The trade is only fair, the higher price of Wire Nails apparently having had no effect on the demand for this class of goods. Small lots from stock are unchanged at $1.45.

Advices from St. Louis.—There is no change to note either as regards prices or the demand. Jobbers ask $1.40 to $1.45 for small lots from store.

Barb Wire.—In common with other Wire products Barb Wire has a firm tone and the advanced prices recently agreed upon by the manufacturers are well maintained. The trade are beginning to place orders quite freely.

Advices from Chicago.—The factories are reported to be shipping out their Wire as fast as made, no stocks having been accumulated in warehouses this winter. The spring movement is expected to be very good, promising to keep manufacturers well employed. Jobbers still continue to sell small lots at about $1.60 for Painted and $1.90 for Galvanized.

Advices from St. Louis.—The demand for Barb Wire is very heavy and mills have advanced prices. Jobbers quote small lots of Painted at $1.70, with the usual advance for Galvanized.

Shot—The announcement of the decline in Shot as mentioned in our last issue has been followed by an advance of 5 cents per 25-pound bag, the present prices of the Eastern manufacturers, which went into effect February 14, being as follows, terms net cash 30 days, or 2 per cent. discount for cash in ten days and the usual discount on ton lots :

Drop Shot, sizes smaller than B, per 25-pound bag	$1.22
" " " " " " " 5 " "	.30
" " B and larger sizes, per 25-pound bag	1.47
" " " " " " " 5 " "	.35
Buck Shot, per 25-pound bag	1.47
" " " 5 " "	.35
Chilled Shot, per 25-pound bag	1 50
" " " 5 " "	.35
Dust Shot, per 25-pound bag	2.00
" " " 5 " "	.50

The prices in the West are about 10 cents less.

Glass.—The number of Glass factories in operation is on the increase, the capacity now being represented by 1876 pots, and it is not improbable that this number will be increased within the next week or ten days to nearly 1900. Most of the product of the independent factories is controlled by jobbers or the factories are operated by them. Spring orders are not being placed very liberally by jobbers dependent upon the association factories for their supply of Glass, apparently not being satisfied with the changed conditions resulting from the formation of the American Glass Company. New York jobbers report demand by the retailers as light, and that a discount of 85 and 10 per cent. is still obtainable for Glass in small lots.

Mica.—Eugene Munsell & Co., New York and Chicago, have issued the new standard price-list of Mica for 1898, as agreed upon by the association. These prices are subject to change without notice. The following discounts accompany the list:

North Carolina	40 per cent.
Wyoming	50 per cent.
Assorted Packages	Net. No discount.

All Mica is delivered to any part of the United States free of transportation charges.

White Lead.—The market for White Lead has been enlivened somewhat by larger orders for spring delivery and an upward turn in the market for base material. The list prices of the leading corroders are unchanged, however, as are their terms, and no important fluctuation has taken place in prices of the foreign brands. Business in the latter is mostly of a retail character.

Red Lead.—Both domestic and foreign Red Leads are quoted unchanged in price, with only fair sales, and the demand is not above the average for the season.

Linseed Oil.—Until within a day or two wholesale prices for both city and out of town makes were maintained at the range quoted last week, but latterly competition has become somewhat livelier and the market has weakened in consequence. Retail prices have not been changed, however.

Spirits Turpentine.—Dealings have been very fair, but mostly in moderate quantities, and prices have undergone very little change.

Old Rags, Paper, &c.—The market shows a fair amount of activity, but no quotable change in values, which remain firm at about former quotations. Dealers

are paying about the following rates for New York City delivery:

No. 1 White Rags	per lb.	2⅝ to 2¾c.
No. 2 White Rags	per lb.	1¾ to 1⅞c.
Mixed Rags	per lb.	1 c.
Blues and 3ds	per lb.	1 c.
Hard Sized White Shaving	per lb.	1¾ to 2 c.
No. 1 White Book Shavings	per lb.	1½c.
No. 2 White Book Shavings	per lb.	¾ to 1 c.
Light Book Shavings	per lb.	½ to ¾c.
No. 1 Mixed Shavings	per lb.	¾ to ⅞c.
No. 2 Mixed Shavings	per lb.	½ to ⅝c.
No. 1 Printed Books	per lb.	⅞ to 1 c.
Ordinary Mixed Books	per lb.	½c.
Newspapers	per lb.	½ to 9/16c.
No. 1 Manila Paper	per lb.	⅝ to ¾c.
No. 2 Manila Paper	per lb.	⅜ to ½c.
Bogus Paper	per lb.	⅜c.
Common Paper	per lb.	¼ to 9/10c.
Straw Chips	per lb.	⅜c.
Binders' Clippings	per lb.	½c.
Jute Butts	per lb.	1⅛ to 1¼c.
No. 1 Jute Bagging	per lb.	¾ to 1 c.
Mixed Bagging	per lb.	½ to ¾c.
No. 2 Bagging	per lb.	½ to ¾c.
Hemp Twine	per lb.	1⅜ to 1¾c.
Manila Rope	per lb.	1¾ to 2 c.
Jute Rope	per lb.	1½ to 1¾c.
Mixed Rope	per lb.	¾ to ⅞c.

Old Rubber.—A fair demand is noted and prices show no quotable change. Local dealers are paying about the following figures:

Car Springs, ton lots, per lb	3½ c.
Rubber Shoes, carloads, delivered at factory, per lb	4¾ to 5 c.
Rubber Shoes, less than carloads, per lb.	4.70c.
White Wringer Rolls, per lb	4 c.
White Syringes, per lb	4 c.

Spelter in 1897.

C. Kirchhoff, agent of the United States Geological Survey, has issued a statement relating to the production of spelter during 1897, the figures being as follows:

Production of Spelter (Short Tons).

States.	1897.	1896.	1895.
Eastern	7,218	8,139	9,484
Southern	3,365	2,427	3,697
Illinois and Indiana	37,876	36,173	35,732
Kansas	33,396	20,759	25,775
Missouri	18,125	14,001	14,998
Totals	99,980	81,499	89,686

Capacity has been considerably increased during the year. The Nevada Spelter Company have built four new furnaces; Robert Lanyon's Sons Company have erected a large plant at Iola, Kan.; W. & J. Lanyon have erected new works in the same State, and a third plant is approaching completion in the district. The Empire Zinc Company have added one block to their Joplin Works. The Swansea Vale Zinc Company are erecting a new plant. Humphrey, Chipman & Co. started the works at Wenona, Ill., in September, and will soon have the plant at Upland, Ind., working. Producers representing a total output, in 1897, of 61,883 tons report a decline in stocks from 3306 to 1538 tons.

A statement of exports of spelter shows that there were exported 14,245 net tons during 1897, of which 598 tons were shipped from New York, 6396 tons from Galveston, Texas, and 6828 net tons from New Orleans. Of the total quantity 13,582 tons were shipped to England.

The National Association of Manufacturers, who have had their headquarters hitherto at 1743 North Fourth street, Philadelphia, are about to remove their general offices to other and more convenient quarters in the Philadelphia Bourse. Large offices on the ground floor of the building, at the Fourth street end, have been secured as well as a suite on the mezzanine floor above. The new offices will be occupied during the present week. The offices in the Bourse will be made a general headquarters for manufacturers, and a large room on the mezzanine floor will be set aside for meetings of the members whenever desired. It will also be used for meetings of the Executive Committee. The rapid expansion of the work and the necessity of increasing the office staff has called for the change of quarters now undertaken.

The Youngstown Freight Committee has decided to reduce the rates between points in the Mahoning and Shenango valleys on pig iron, billets, sheet and tin plate bars and scrap. The reductions are to take effect at once, and are for the purpose of equalizing the cost of assembling material at the mills of the two valleys.

TRADE NOTES.

In their advertisement, elsewhere in this issue, Jno. W. Bell & Co., Mercer, Pa., direct attention of the trade to their Wire Eave Trough Hanger. The fact is referred to that this Hanger is of neat appearance, strong and sold at a low price. It is handled by the jobbing trade.

In our special advertising columns this week notice is given by E. Bissell, Son & Co., 12 Murray street, New York City, of a special sale by order of the St. Louis Stamping Company, St. Louis, Mo., of six carloads of Granite Enameled Ware, to be sold in case lots only. The goods include a full line of Tea and Coffee Pots, Dish, Milk, Fry and Pudding Pans, Pails, Buckets, &c.

The two Sheet mills of the Sharon Iron Works, Sharon, Pa., which have been idle for a long time, were last week put in operation.

The Leos Metal Polish Company of Chicago have been incorporated, with a capital stock of $3000. Incorporators: George D. Eddy, A. M. Eddy, Thomas A. Easter and W. H. Lahman.

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Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 17, 1898.

Tin—

Straits pigs.....15½@15¾¢

American Tin Plates—

American Base Box Quotations.

Based on 32,000 square inches in a box, which is exactly 2 per cent. more than in the English base box of 14 x 20 Tin Plates. The American base box weighs 110 ℔ and the English base box 108 ℔.

Highest Grade Charcoal—Bright.

Size.	Base.	Contents.	Per box.
10 x 14,	110-℔	...240 sheets	.....$5.65
"	140-℔	" "	..... 7.25
12 x 12,	110-℔	" "	..... 5.75
"	140-℔	" "	..... 7.50
14 x 20,	110-℔	....120 "	..... 5.65
"	140-℔	" "	..... 7.25
"	160-℔	" "	..... 8.85
"	180-℔	" "	.....10.45
"	200-℔	" "	.....13.15

20 x 28 double the price of 14 x 20.

12½x17,	140-℔	....120 sheets	..... 5.35
"	180-℔	" "	..... 6.95

Second Grade Charcoal—Bright.

10 x 14,	110-℔	....240 sheets	..... 5.10
"	140-℔	" "	..... 6.15
12 x 12,	110-℔	" "	..... 5.25
"	140-℔	" "	..... 6.30
14 x 20,	110-℔	....120 "	..... 5.10
"	140-℔	" "	..... 6.15
"	160-℔	" "	..... 7.25

20 x 28 double the price of 14 x 20.

Highest Grade Coke—Bright.

10 x 20,	110-℔	....240 sheets	..... 5.75
12 x 12,	110-℔	" "	..... 4.15
"	140-℔	" "	..... 4.95
14 x 20,	110-℔	....120 "	..... 4.00
"	140-℔	" "	..... 4.85

20 x 28 double the price of 14 x 20.

20x26½,	110-℔	....120 sheets	..... 8.00
20x29½,	110-℔	" "	..... 8.85
20x32½,	110-℔	" "	..... 9.90
"	140-℔	" "	.....12.35
20x39½,	140-℔	" "	.....15.00

Old English Method Quotations.

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Meiyn Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	..... $5.25
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	..... 6 75
	IXX, 14 x 20	..... 8.25
	IXXX, 14 x 20	..... 9.75
	IXXXX, 14 x 20	..... 11.25
	DC, 12½ x 17	..... 5.00
	DX 12½ x 17	..... 6.50
Allaway Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	..... 4.75
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	..... 5.75
	IXX, 14 x 20	..... 6.75
	IXXX, 14 x 20	..... 7.75
	IXXXX, 14 x 20	..... 8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	..... $3.75
	IC, 10 x 20	..... 5.50
	IC, 17 x 17	..... 7.75
	IC, 20 x 26½	..... 7.75
	IC, 20 x 29½	..... 8.50
	IC, 20 x 32½	..... 9.00
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	..... 4.50
	IX, 20 x 32½	..... 12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔	.....15¢
95 ℔	.....20¢
90 ℔	.....25¢
85 ℔	.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	...$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	... 10.50@ 12.00
Worcester Grade, 12 to 14 lbs. coating	... 8.00@ 9.00
STP / L Grade, 10 to 12 lbs. coating	... 7.50@ 8.00
Dean Grade, 8 to 10 lbs. coating	.. 7.25@ 8.00

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		.....$7.25
IX, 14 x 28	.....$10.00	10.25
IXX, 14 x 28	..... 11.50	12.75
IX, 14 x 31	..... 11.50	12.75
IXX, 14 x 31	..... 13.00	14.00

	Per box of 56 sheets.
IX, 14 x 56 ..... 21.00	$12.50
IXX, 14 x 56 ..... 24.00	14.00
IX, 14 x 60 ..... 23.00	13.50
IXX, 14 x 60 ..... 27.00	15.00

Iron and Steel Sheets—

Black.

	Soft Steel.	Refined Iron.
Nos. 10 to 16...₩ ℔	2.00¢	2.20¢
17 to 20...₩ ℔	2 10¢	2.30¢
21 to 24...₩ ℔	2.20¢	2.40¢
25 and 26.₩ ℔	2.30¢	2.50¢
27.. .....₩ ℔	2.40¢	2.60¢

Russia, Planished, &c.	100 ℔.
Patent Planished, ₩ ℔, A	....$10.20 (5%
Patent Planished, ₩ ℔, B	..... 9.20) dis.
Craig's Polished Sheet Steel	.....8½¢
U.S. Polished Sheet Steel No. 27 A	5.05¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....11½@ 11⅝¢
Casting Brands.....11⅜@ 11½¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17¼c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ ℔ additional.

Brazed Brass Tubing, (100 ℔ lots). (To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch	.....$0.35
Plain, ⅝ inch up to ¾ inch	..... .36
Plain, ½ inch up to ⅝ inch	..... .38
Plain, ⅜ inch up to ½ inch	..... .41
Plain, 5-16 inch up to ⅜ inch	..... .08
Plain, ¼ inch up to 5-10 inch	..... .65
Plain, 3-16 inch up to ¼ inch	..... 1.00
Plain, ⅛ inch up to 3-16 inch	..... 1.50
Plain, 2 inch up to 3 inch	..... .38
Plain, 3 inch and larger	.....Special.
Plain, smaller than ⅛ inch	.....Special.
Bronze and Copper	.....3¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots ..... ₩ ℔, 40¢
100-℔ lots.....₩ ℔, 36¢
No. 2 (guaranteed over 90% pure).
Small lots.....₩ ℔, 34¢
100-℔ lots.....₩ ℔, 33¢
Nickel Aluminum Casting Metal.
Small lots.....₩ ℔, 39¢
100-℔ lots.....₩ ℔, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....₩ ℔, 35¢
100-℔ lots .....₩ ℔ 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....₩ ℔, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter .....₩ ℔, 55¢
Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 ℔ or more. Less quantities, 5¢ ₩ ℔ additional.

Wider than	6-in.	14-in.	24-in.
And including.....	14-in.	16-in.	30-in.
	₩ ℔	₩ ℔	₩ ℔
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23.....	.42	.42	.47
" 24.....	.42	.44	.49
" 25.....	.43	.45	.50
" 26.....	.43	.46	.55
" 27.....	.44	.48	.58
" 28.....	.44	.50	.60
" 29.....	.45	.52	.65
" 30..	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-℔ casks..... 5¾¢
300-℔ casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55..... .....10½¢
Extra Wiping.... ....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead .....4¢
Bar.. .....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&10%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead GalvanizedLapJoint80&25%
Double Bead GalvanizedSlipJoint80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized .....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne .....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.35
Merchant & Co.'s Gothic Shingles.

		10 x 14	14 x 20
IC Tin.	₩ square,	$4.75	$4.50
Galv.....	₩ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....₩ ℔ 2 ¢
" " Brown.....₩ ℔ 1½¢
" " Purple .....₩ ℔ 2½¢
" " Ground in oil, B. Red, ₩ ℔ 6½¢
" " Ground in oil, Red...₩ ℔ 6½¢
" " Ground in oil, Brown, ₩ ℔ 5½¢
" " Ground in oil, Purple, ₩ ℔ 6½¢
Linseed Oil, Boiled, in bbls.....44¢
Linseed Oil, Raw, in bbls.....42¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 8 to 6 ¢
Sipe's Japan Oil, in bbls., ₩ gal..... .84¢
Spirits Turpentine, in bbls., ₩ gal... 38¢
Asphaltum, Trinidad Refined, ₩ ton. $45
Tarred Felt, 1 Ply, ₩ 100 ℔.....$1.25
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ₩ roll 108 sq. feet..... ... .$1.25
Roofing Pitch, ₩ bbl of 300 ℔.....$3.00

NEW YORK, FEBRUARY 18.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ ℔, 40¢
100-℔ lots.....₩ ℔, 36¢
Aluminum Rods, from ¼-in. diam. to 1 in. diam.....₩ ℔, 53¢
Aluminum Sheet, B. & S. gauge. In lots of 50 ℔s or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₩ ℔	₩ ℔.	₩ ℔.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.56	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 ℔s 5¢ ₩ ℔ extra.

Antimony—

Cookson.....₩ ℔, 8½¢
Hallett's.....₩ ℔, 7¾@8¢
Japanese.....₩ ℔, 7½¢

Brass—Planished.....net

Roll and Sheet .....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per ℔.	
¼-in. up to 2-in.....	$0.35	35% off.
5/32-in. up to ¾-in.....	.36	
1/8-in. up to ⅞-in.....	.38	
3/16-in. up to 1 in.....	.41	
5-16-in. up to 3/8-in.....	.48	
¼-in. up to 5-16-in.....	.65	
3-16-in. up to ¼-in.....	1.00	
1/8-in. up to 3-16-in.....	1.50	
Smaller than 1/8-in.....	Special	
3-in. and larger.....	Special	
2-in. to 3-in., to No. 19, inclusive.	.38	

Copper & Bronze Tubing—

3¢ ₩ ℔ more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ ℔ 18½@19¢ basis
Ingot.
Lake.....12¼¢
Ausonia Grade Casting.....11½¢
Planished.....net
Sheet and Bolt.....15¢ ₩ ℔ basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₩ ℔, 2 00....	2.30¢
Nos. 17 to 21.....	₩ ℔, 2.10....	2.40¢
Nos. 22 to 24.....	₩ ℔, 2.20....	2.50¢
Nos. 25 and 26...	₩ ℔, 2.30....	2.60¢
No. 27.....	₩ ℔, 2.40....	2.70¢
No. 28.....	₩ ℔, 2.50....	2.80¢
American B. B.....		₩ ℔, 4¢

Russia, Planished, &c.
Genuine Russia, according to assortment.....₩ ℔, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ ℔, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ ℔ 8½¢

Galvanized.
Nos. 10 to 16.....₩ ℔, 12¢
Nos. 17 to 21.....₩ ℔, 13¢
Nos. 22 to 24.....₩ ℔, 14¢
Nos. 25 to 26.....₩ ℔, 15¢
No. 27.....₩ ℔, 16¢
No. 28.....₩ ℔, 17¢
No. 29.....₩ ℔, 19¢
No. 30.....₩ ℔, 21¢
(75&10& 5% off.)
36 in. 1¢ ₩ ℔ higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛@4.20¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₩ ℔.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per ℔.....38¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 ℔..... 6 ¢
Lead, Amn. White, in oil..... 6 ¢
Lead, Red bbls. and ½ bbls..... 6 ¢
Lead, Red, kegs..... 6 ¢
Ochre, American..... 1½¢
Red Venetian, American..... 1¾¢
Linseed Oil:
Raw, ₩ gal.....45@46¢
Boiled.....47@48¢
Spirits Turpentine:
In bbls.....36¢
In cases.....44¢
Putty:
In barrels and ½ bbls..... 1¾@2¢
In tubs.....1¾@2¢
In tin cans..... 2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 ℔ casks.

Fancy Lagos.....₩ ℔ 5 ¢
Clarified.....₩ ℔ 4⅞¢
Accra.....₩ ℔ 4¾¢
Half Jack.....₩ ℔ 4½¢
Cecilia.....₩ 100 ℔ $4.85
Choice Red.....₩ 100 ℔ 4.60
(*Spot Oil*, ⅛c. ₩ ℔ *higher.*)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline.....	₩ gal.	10@11¢
Kerosene.....	₩ gal.	8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves..65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.
Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897..... 40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons..... 75%
Galvanized Iron Range Boilers above 52 gallon.....65%
N B.—5 % extra on Standard 30, 35 and 40 gal. Boilers.
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....60%
" " " Backs Plain.....60%
" " " " Galvanized....60%
" " " Legs Plain.....60%
" " " " Galvanized....60%
" " " Backs with air chambers, Plain.....60%
Cast Iron Sinks, Backs with air chambers Galvanized 60%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.
Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated..... 40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock. ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ ℔.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₩ bbl.	$1.48@	$1.49
Rosin, E & F.....	₩ bbl.	1.55@	1.60
Rosin, G. & H.....	₩ bbl.	1.70@	1.80
Rosin, I. & K.....	₩ bbl.	1.85@	1.90
Rosin, M. & N.....	₩ bbl.	2.10@	2.20

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:
Best Bangor, ₩ sqr. .....$3.50@$4.50
No. 1 Baugor Ribbon..... 3.00@ 3.25
Pen Argyle, ₩ sqr..... 3.25@ 3.50
Peach Bottom, ₩ sqr..... 4.75@ 5.60
No. 1 Chapman, ₩ sqr.... 3.00@ 4.25
Lehigh Slates, ₩ sqr... .. 3.25@ 3.80
Vermont:
Sea Green, ₩ sqr.....$2.45@$3.05
Purple, ₩ sqr..... 3.75@ 4.00
Variegated Purple..... 2.25@ 2.90
Unfading Green, ₩ sqr... 3.50@ 4.00
Red, ₩ sqr..... 8.50@10.50

Solder and Soldering Fluids— Solder—

½&½ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs about 55 ℔, ₩ ℔.....4¢
(5 % dis.)

Yager's Soldering Salts.
½ ℔ bottles, each.....80¢
Large quantities, ₩ ℔.....40¢

Soldering Coppers—

Per ℔.....15¢@16¢ net

Spelter—

Western Spelter..... 4½¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ ℔.....15½¢
Straits, pigs, ℔ ℔.....14½@15¢
Straits, in bars, ₩ ℔..... .....15½@16¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12⅝ x 17	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.00
" "	IXX,	14 x 20	5.75
" "	IXXX,	14 x 20	6.50
" "	IXXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 ℔	10¢
95 ℔	15¢
90 ℔	20¢
85 ℔	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 ℔ coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 ℔ coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 ℔ coating.....	8.00 @ 9.25
STP Grade, 10 to 12 ℔ coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ ℔.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke,	IC, 14 x 20.....	$4.25
	IX, 14 x 20.....	5.25

Terne Plates—

Worcester Grade,	IC, 14 x 20.....	4.25
	20 x 28.....	8.50
Dean Grade,	IC, 14 x 20.....	4.00
	20 x 28.....	8.00
Gilbertson's Old Method,	IC, 14 x 20..	7.50
	20 x 28..	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 189 .

1¼ and less, Plain	57&10%
1¼ and less, Galv.	50&10%
1½ and larger, Plain.....	67&10%
1½ and larger, Galv.....	55&10%
Screw and Socket Joint Casing.....	65%
Inserted Joint Casing.....	60%
Boiler Tubes, 2¼ inch and smaller.	72½%
" 2¾ inch and larger	75%

Zinc—

600 ℔ casks ₩ ℔ 5¾¢ | Per ℔.....6¼¢

CLASSIFIED LIST OF ADVERTISERS.

Acetylene Gas Generators.
Colt, J. B. & Co., 115 Nassau St., N. Y.

Acid Swabs.
Sherman, J. S., Cassopolis, Mich.

Agate Ware.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Agricultural Furnaces.
Wheeler, Russel & Son, Utica, N. Y.

Aluminum.
Hill-Whitney Aluminum Co., Boston, Mass.
Reymond & Gottlob, 26 Cortlandt St. N. Y.

Aluminum Ware.
Illinois Pure Aluminum Co., Lemont, Ill.

Architectural Ornaments.
Art Metal Relief Co., Covington, Ky
Frand, Martin J. & Co., Camden, N. J
Friedley & Voshardt, Chicago, Ill.

Ash Sifters.
Campayna, Eugene W., Randolph, Mass.

Baskets, Metallic.
Kleckhefer Bros. Co., Milwaukee, Wis.

Bathtubs.
Peck Bros. & Co., New Haven, Conn.
Wilson, R. M. Mfg. Co., Rome, N. Y.

Beer Pumps.
I. X. L. Beer Pump Co., Phila., Pa.

Boilers, Range.
Wolff, L. Mfg. Co., Chicago, Ill.

Bronze and Bronzing Liquid.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Can Makers' Tools and Machines.
Bliss, E. W. Co., Brooklyn, N. Y.
Gordon, W. J., Phila., Pa.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
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BEFORE PLACING YOUR ORDERS.

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LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

TRAVELING SALESMAN thoroughly posted in enameled ware and acquainted in New England territory; state age and full previous experience, or no attention. "New England," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 19

FOREMAN and CUTTER for cornices and jobbing shop; must be up to date in all requirements; a good situation to the right man. Max Jennings, Logansport, Ind. Feb. 19

Good all around TINNER and SHEET IRON WORKER for country shop; must have knowledge of hardware; one who can speak the Holland language preferred; state age, references and wages expected. John Q. Smith, Palmyra, N. Y. Feb. 19

An experienced TINNER with some knowledge of plumbing and hot air heating; must be sober and reliable; state wages wanted. Lock Box 73, Newton, N. J. Feb. 19

A FOUNDRY FOREMAN and ASSISTANT SUPERINTENDENT in a large stove foundry; a man who has practical knowledge of stove plate molding and foundry; no applications will be considered that do not state age, references, experience, present or last employers and salary expected. Address "Stove Manufacturer," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 19

By March 15 a PLUMBER and TINNER; one who can do all work that comes to a country tinshop; must be strictly temperate and not use tobacco; address with reference from last employer and wages wanted per day. "Iron Pipe," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 19

Incandescent gas mantle SALESMAN wanted; a good side line in any city or town among plumbers, gas fitters and others; finest goods, prices guaranteed. Tucker & Koester, 116th street, East River, New York City. Feb. 19

A STOVE PATTERN FITTER, a thoroughly reliable man; must be able to work in white metal and brass, and be acquainted with all work pertaining to stove patterns; to a first-class man steady work will be given; state reference and wages expected. "B," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 19

We require the services of a first-class CORNICE WORKER, who will assist our foreman in the laying out of work; must be an expert workman in the use of the Robinson cornice brake; a steady workman can have a permanent position; give reference and state salary desired. Springfield Cornice Works, Springfield, Mass. Feb. 12

A CORNICEMAN who can cut, make and put up; must be quick and willing and able to do all kinds of job work in shop in a first-class manner; also roofing; want a sober, industrious, married man. Geo. A. Brush, Austin, Texas. Feb. 12

TRAVELING SALESMEN.—Young men of good education, of good appearance and thorough acquaintance with all kinds of stoves and ranges are wanted by one of the largest houses. Address, with photograph, giving age, experience and salary expected, "Apex," office of *The Metal Worker* 232-238 William street, New York City. Feb. 12

In retail hardware store at Chicago, an experienced CLERK who can also keep books; must speak German; steady position for a hustler. "German," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 12

SALESMAN who calls on stove trade to carry side line of artificial and natural gas hot plates through West Virginia, Kentucky and Maryland. 1216-1218 Peach street, Erie Pa. Feb. 12

Three STOVE PATTERN MAKERS: must be first-class mechanics, active, reliable and competent; state age and also wages wanted. F. S. Weller, Pattern Works, Quincy, Ill. Feb. 12

TRAVELING SALESMEN to handle iron beds as side line in their territory. New Kensington Mfg. Company, New Kensington, Pa. Feb. 12

A first-class TINNER; capable of making all kinds of tinware, doing roofing and spouting, laying out work and managing men; must be sober, honest and a hustler; steady work. Raymond Barnes, Mount Airy, Md. Feb. 12

Two TRAVELING SALESMEN to sell a newly patented article to breweries, saloons and plumbing shops; must have experience and good references; salary and commission at first; salesmen everywhere. H. Bentelspacher, corner Gold and Water streets, Bridgeport, Conn. Feb. 12

A competent PATTERN CUTTER and worker in galvanized iron and tin shop; one used to working at various things as they may come in; a steady man and a steady job inside; answer stating wages wanted. "A. B.," No. 212, office of *The Metal Worker*, 232-238 William street, New York City. Feb. 12

Large English steel hollow ware firm in Midland counties require experienced FOREMAN to take entire charge of white and white and blue and white enameling department; must be thoroughly competent in all branches and able to control hands. Apply in first case to 206-46 *Ironmonger* office, 42 Cannon street, London. Feb. 5

SITUATIONS WANTED.

As TINNER, by a young man who can do all kind of inside and outside work; some experience at pipe fitting; temperate and honest; reference. Perry Shipman, Celina, Ohio. Feb. 19

By a first-class ELECTRO-PLATER; can do all kinds of plating and oxidizing, &c.; can give best of reference. "B. C. W.," 195 Butterworth avenue, Grand Rapids, Mich. Feb. 19

Young man 23 years of age, two years' experience at tinners' trade; inside and outside work; desires to finish trade, also plumbing; reference. "B. W. F.," Box 272, Addison, N. Y. Feb. 19

By a young man 24 years of age, who has had nine years' experience at plumbing and gas fitting; temperate, married; willing to go anywhere. G. D. Hancock, 258 Castle street, Geneva, N. Y. Feb. 19

By a young man 20 years of age, who has had two years' experenice as hardware clerk and two years at plumbing, tinning, furnace work, &c.; wages moderate; good reference; strictly temperate; city or country. F. J. Eagen, Minooka, Pa. Feb. 19

By a man up to date, as FOREMAN of mounting department or INSPECTOR; can give best of reference as to ability. Address J. F. Hyatt, 14 Wilson street, Albany, N. Y. Feb. 19

BOOKKEEPER and STENOGRAPHER, six years' experience as a bookkeeper and one year as traveling salesman; graduate of high school and University; also hold county teachers' certificates; at present employed, but desires to change; references. B. D. Higgins, Piqua, Ohio. Feb. 19

By a practical TINSMITH, furnace, sheet iron work, slating and general jobbing; 18 years' experience; married man with family. Coleman Baxter, Canal Winchester, Ohio. Feb. 19

As FOREMAN in cornice and sheet metal works; good draftsman, long experience. "Amer. No. 219," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 19

By a young man 19 years of age, as TINSMITH in some country shop; has had about four years' experience at tinning, pump and stove work; has also worked at plumbing; can furnish references; reasonable wages expected. Roscoe Batey, P. O. Box 99, Patchogue, L. I. Feb. 19

In a stove works, many years' experience in the several capacities of stove plate and stove pattern molder, foundry foreman, superintendent and foundry expert; can report at short notice at any point, and accommodate myself to circumstances, having no family; references. J. T Peet, librarian of the Military Home, Leavenworth, Kan. Feb. 19

By married man 32 years of age, steady position; understand roofing, dairy and cheese factory work, tinware, furnace work, stoves and range repairing, and can do common jobs of plumbing and pipe work; in last position six years; can give good references; understand hardware and stove work and can clerk in store if desired. "Royal Arch," Lock Box 171, Theresa, N. Y. Feb. 19

By two SLATE and TILE ROOFERS. "Roofer," Kimball House, Albany, N. Y. Feb. 19

Steady position as TINSMITH; considerable experience at plumbing, steam fitting and general jobbing. Box 860, Newton, N. J. Feb. 19

By a first-class BRASS and LEAD PLUMBER; can do hot water fitting, roofing, furnace, pump work and general jobbing; 15 years at trade; first-class references; New York State; state wages. Jas. A. Reber, 204 East 105th street, New York City. Feb. 19

A permanent position by a practical TINSMITH, inside or outside work, also bicycle repairing; Eastern or Southern New York preferred; strictly temperate; reference from former employer. "G. T. W.," Box 55, Salisbury Mills, N. Y. Feb. 19

As OUTSIDE SUPERINTENDENT, SOLICITOR and CONTRACTOR, first-class steam and mechanical engineer; thorough knowledge of steam and water heating, steam circulation for all purposes; hotel, restaurant and hospital outfits, laundries, dry rooms, kilns, ovens, &c.; high and low pressure work, competent estimator, draftsman and designer; first-class references, moderate salary. "Steam Circulation," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 19

By a practical TIN and SHEET IRON WORKER, roofing, guttering, spouting, making up new tinware and general repairing; have had charge of shop for 12 years; reference from last employer. C. D. Adams, Moravia, N. Y. Feb. 19

By good all around WROUGHT STEEL RANGE BUILDER and MOUNTER, well posted on cooking apparatus; will frunish all bench tools. "Steel Range," 320 Fort street, Detroit, Mich. Feb. 19

By a first-class ROOFER, CORNICE HANGER and HOT AIR WORKER; sober and industrious; 15 years' experience; has own tools, a knowledge of metal ceiling, steam and hot water, iron pipe work, and plumbing; a steady position city or country. "W. A. H.," 226 Wall street, Kingston, N. Y. Feb. 19

As TINSMITH by a young man who has had seven years' experience at shop work, roofing, spouting, pump and general job work; can clerk in store and keep books; married; steady position desired with a good man; reference. "Tinsmith," Prattsville, N. Y. Feb. 19

As SUPERINTENDENT in manufacture of cornices, skylights and ventilation work; practical in all branches of the trade, estimates carefully; sober and reliable; 20 years' experience; salary expected. "A. J. B," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 19

By a first-class STEAM, HOT WATER and HOT AIR HEATING ENGINEER, PLUMBER and TINSMITH; total abstainer; can estimate and take full charge. P. O. Box 323, Woodbury, N. J. Feb. 19

By a good BOOKKEEPER, German, energetic, thoroughly conversant with the slate and slate roofing business; good estimator; last employed in range factory; references. "R. F.," 18 Sumner Place, Brooklyn, N. Y. Feb. 19

First-class PLUMBER, nine years' practical experience, desires a steady position in any part of the United States; can furnish A1 reference. James P. Godsill, 185 West Sixty-third street, New York City. Feb. 19

By a PLUMBER, GAS FITTER and ROOFER; understands both city and country work, new work and general jobbing; have journeyman's license and reference; city or country. A. Yach, 718 Second avenue, New York City. Feb. 19

By a TIN and SHEET IRON WORKER and GENERAL JOBBER; city or country; accustomed to gutters, leaders, heater and range work; eight years' experience; strictly sober; single man; can furnish good references if required. Henry A. Wolfson, 73 East 106th street, New York City. Feb. 19

By a first-class CUTTER; understands furnace, range work and tin roofing; sober and reliable; 22 years' experience. New York or vicinity. "Lawrence," 289 Madison avenue, New York City. Feb 19.

SALESMAN who has extensive acquaintance among architects and builders in New York is open for position; experienced in gas range and steam and hot water heating lines; A1 references; open for anything. "A. B. S.," care Dayton & Montgomery, 71 Flatbush avenue, Brooklyn, N. Y. Feb. 12

A permanent position by a first-class TINSMITH and MECHANIC; eight years' experience on furnace and all kinds of job work; thoroughly familiar with the hardware trade; strictly temperate; married; references. F. C. Lilley, 75 West Ninety-fifth street, New York City. Feb. 12

By a practical TINSMITH at inside and outside work; wages moderate; steady position; city or country. Charles Stark, Box 110, Haledon, N. J. Feb. 12

By a young man, 29 years of age, who is a good general hand at plumbing, iron pipe work, gas fitting, tinning, stove and furnace work; wages $2 per day; sober and honest. Joseph Smith, 66 Cliff street, New York City. Feb. 12

By a good all around TINSMITH; used to heater work, roofing, piping and general jobbing; some knowledge of plumbing; wages moderate for a steady job; single: 30 years' experience. G. Hitchcock, 209 Main street, Poughkeepsie, N. Y. Feb. 12

Special Notices.

Our previously advertised list having been largely sold we offer the following additional bargains.

1 8 ft. Niagara Gutter Beader, ¾ in. Rod		$28.00
6 Wiring Machines and Stands	each	5.00
6 Large Burrs and Stands	"	5.00
1 Lot Bench Shears, Nos. 3, 4, 5, 6	"	2.50
1 Small Rotary Slitter		5.00
12 Assorted D'ble Seaming M'ch'es c'plete	each	12.50
2 400 lb. Foot Presses	"	25.00
12 30 in. Sheet Iron Folders Assorted	"	5.00
12 Assorted Pan and Colander Swedges	"	1.50
6 Assorted Lever Punches ¼ in. in ⅛ in. iron	"	12.00
100 pair Wire Nippers	per pair	.50
1 42 in. Keystone Bar Folder	great snap	55.00
1 36 in. " " " " "	"	40.00
1 36 in. Tube Former	each very cheap.	
1 15 in. " "		
1 11 in. " "		
2 Elbow Seam Closers	each	15.00
2 " Special Turners	"	15.00
50 Wood Roofing Folders	"	1.50
300 Roofing Hammers, No. 1	"	.30
300 " " No. 5, No. 6	"	.20
2 Flanders Circle Shears	"	12.50
1 Upright Solder Cutter		30.00
1 No. 1 Double End Power Crimper		35.00
1 No. 168 Notcher complete		20.00
1 Bliss Triple Action Power Press		235.00
1 Can Screw Machine complete		125.00
1 Asparagus or Spice Can Former		35.00
1 Savage Circle Shear and Burr Attachment		12.50
2 Sardine Can Body Beaders	each	10.00

All goods F.O.B. our store, subject to prior sale.

Tinners' Machinery & Supply Co.,
26 Cliff Street, New York City.

THERE are three tinners and plumbers already established in the small dead village of Pine Plains, Dutchess County, N. Y., and if any other desire to come here to start in the same business there is plenty of room for them to starve to death. WM. WINFRED,
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For Sale.

An established Tin and Sheet Iron business, 40 minutes from New York. No other shop in the place. Good reasons for selling. Cheap for cash. J. P. BROWN, Ardsley, N. Y.

WANTED.

By an old established Hot Air Firm, a first-class line of Steam and Hot Water Boilers. Agency taken for exclusive rights in New York and vicinity. Address "HEATING," office of *The Metal Worker*, 232-238 William St., N. Y.

THIS IS A SNAP.

To a quick purchaser in a thriving town of Western Pennsylvania, on main line of P. R R., a first-class Tin and Slate Roofing and Furnace Shop. Well stocked with best tools. Owner will sell cheap to a quick cash buyer. Special inducement to purchaser will be made known upon application. Address
"FURNACE,"
office of *The Metal Worker*, 509 510 Hamilton Building, Pittsburgh, Pa.

FOR SALE.

In Olmsted Falls Village a 1½ story building used as hardware store and tin shop for sale, rent or exchange Address MRS. L. B. ADAMS, Olmsted Falls, Cuyahoga Co., Ohio.

WANTED.

A set of Furnace Patterns complete. Must be up-to-date and cheap. Address "A. O.," 219, office of *The Metal Worker*, 232-238 William St., New York.

WANTED.

A four or six foot Range Makers' Brake and a Lever Shear with or without punch. Cheap. Address "M. O.," 219, office of *The Metal Worker*, 232-238 William St., New York.

WANTED.

Cornicemen and tinner with small capital to lease established shop with good trade. No competition. Good chance for man who means business. Address "R.," office of *The Metal Worker*, 512 Commercial Bldg., St. Louis.

FOR SALE. A successful Plumbing, Heating and Tin business in a prosperous country place on Long Island near New York City. Employs three to four men constantly. Will sell outright on easy terms lease or exchange for good real estate. Reason for selling, poor health. "L. I.," office of *The Metal Worker*, 232-238 William St., N. Y.

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The patentee of a new Improved Dustless Register wants to either sell same or interest manufacturers who can make same. This register can be manufactured 8 to 10% less than any other register on the market and has strong selling points over any other.

A. L. CANFIELD,
284 Pearl Street, New York.

Special Notices.

Important Auction Notice.

E. BISSELL, SON & CO.,

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BY ORDER OF

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Large Special and Unreserved Sale

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Buyers who need enamled ware as "Leaders" should **not fail** to attend this sale, as the goods **will be sold without any reserve.**

FINE OPPORTUNITY.

On account of failing health I offer for sale my Stove and Hardware business with or without lease on store room. Stock and fixtures will invoice about $9000. This is a snap for a good hardware man.

ALBERT L. WEST,
507 and 509 Walnut St., Des Moines, Iowa.

FOR SALE.

Stove, Hardware and Plumbing business in Northern Illinois. Owner has other business to occupy his time. Good chance. Address W. ALEXIS, office of *The Metal Worker*, 59 Dearborn Street, Chicago, Ill.

WE BUY BRASS AND COPPER CLIPPINGS.

Also Scrap Brass, Copper, Lead and Zinc of every description. In writing for prices kindly give description of goods and state quantity.

DETROIT SMELTING & REFINING CO.,
Detroit, Mich.

FOR SALE.

Stock of Hardware $3000, Stoves $3000, Queensware and Fixtures, $1000. Or will sell half interest to right party and give him charge of it.

H. B. SAHLER, Atchison, Kas.

OWING to the death of the proprietor, a Stove, Heating, Plumbing and House Furnishing business is offered for sale, in Claremont, N. H. A growing manufacturing town of over six thousand inhabitants. This is a first-class opportunity for any one wishing to engage in this business.

A. C. STONE, Administrator,
Claremont, N. H

Special Notices.

A Rare Opportunity.

On account of failing health the owner offers for sale outright a Stove Manufacturing business of more than 30 years' standing, commanding a trade among the very best dealers in Ohio and Indiana. This offer covers a full line of Wood Cooks and Ranges, Coal Cooks and Ranges, also Wood and Coal Heaters. No manufactured stock or real estate is offered. All patterns, follow boards and flasks are in first-class condition and good live working order. Most of best selling patterns have only been in use about three years. Patterns are in active use and on the market and a purchase would include good will of the business. Will sell outright at **very great sacrifice,** or with proper parties would be willing to retain an interest in the business if desired. For further information address
"STOVES,"
office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, O.

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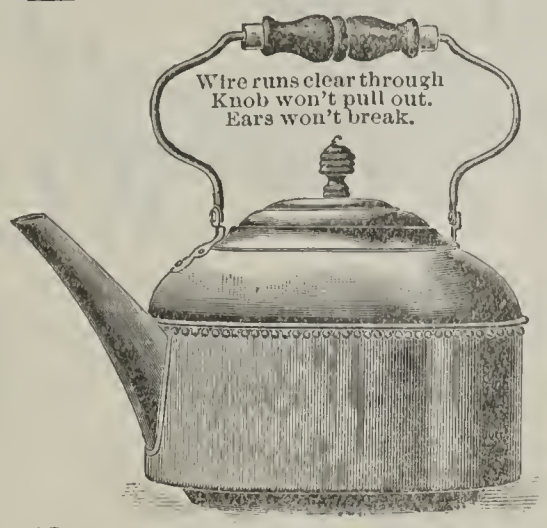
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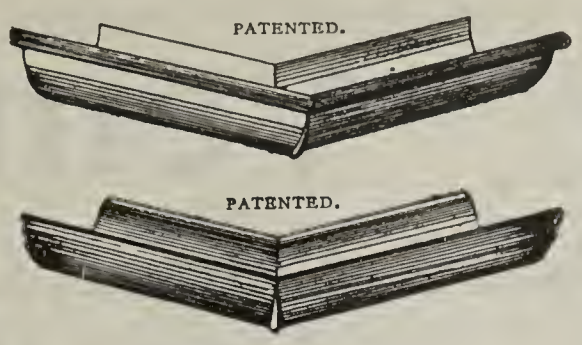
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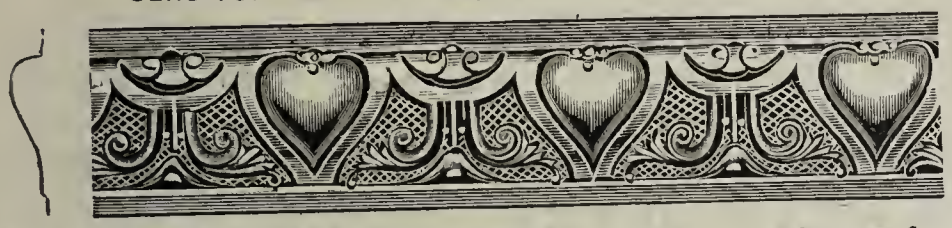
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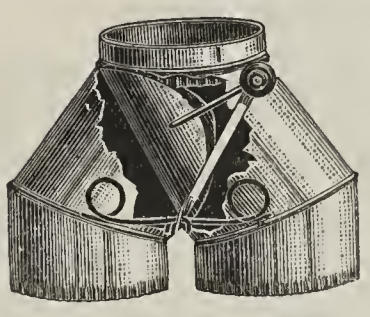


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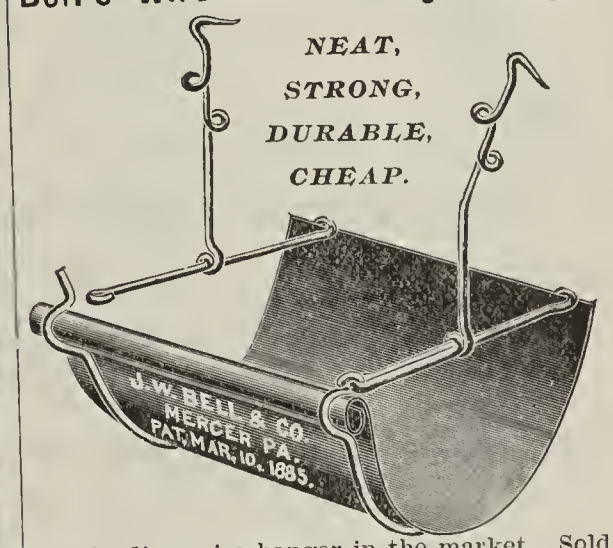
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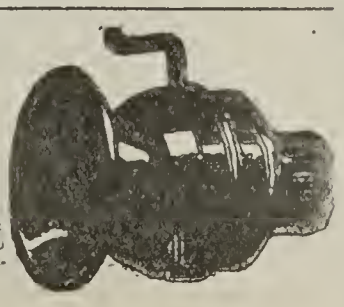
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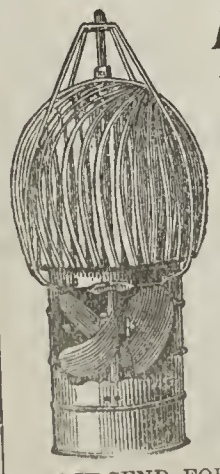
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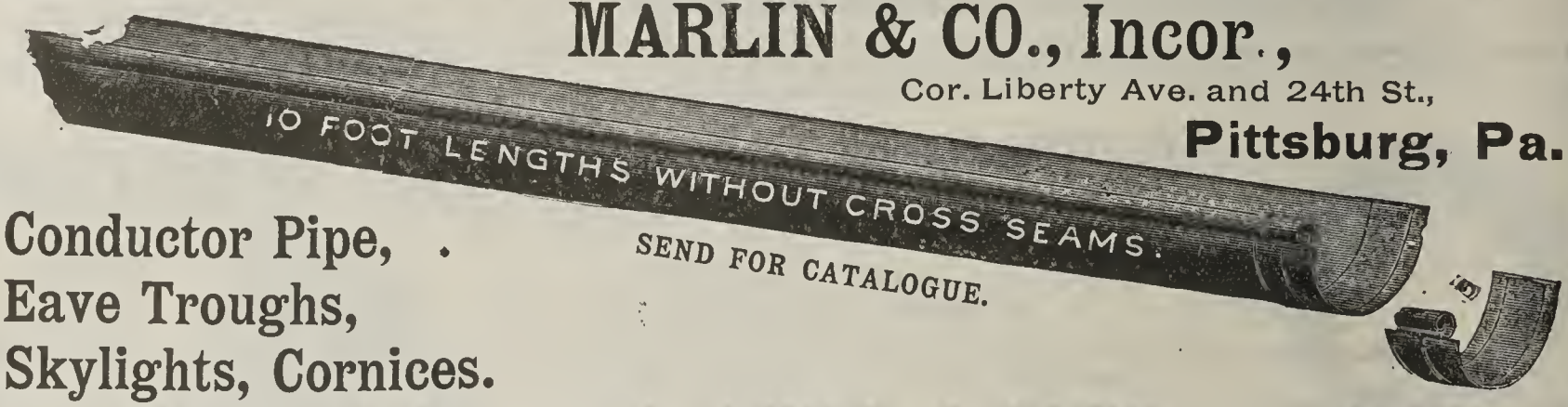
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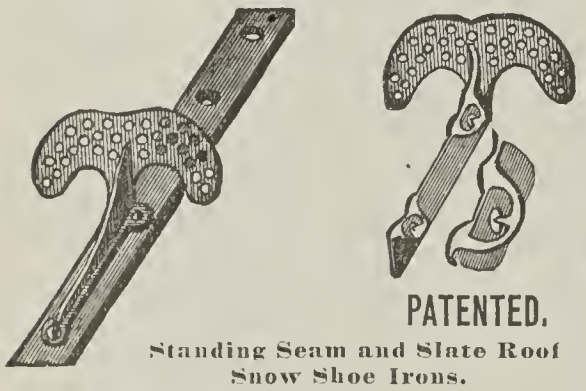
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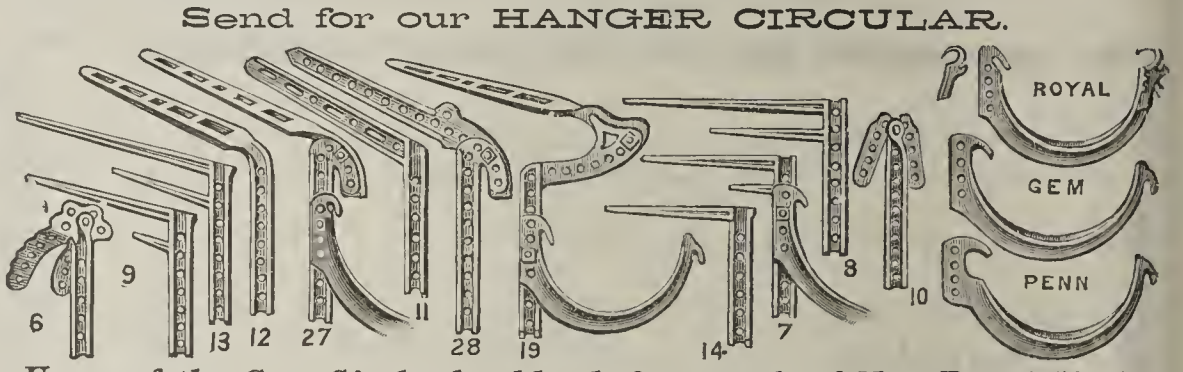
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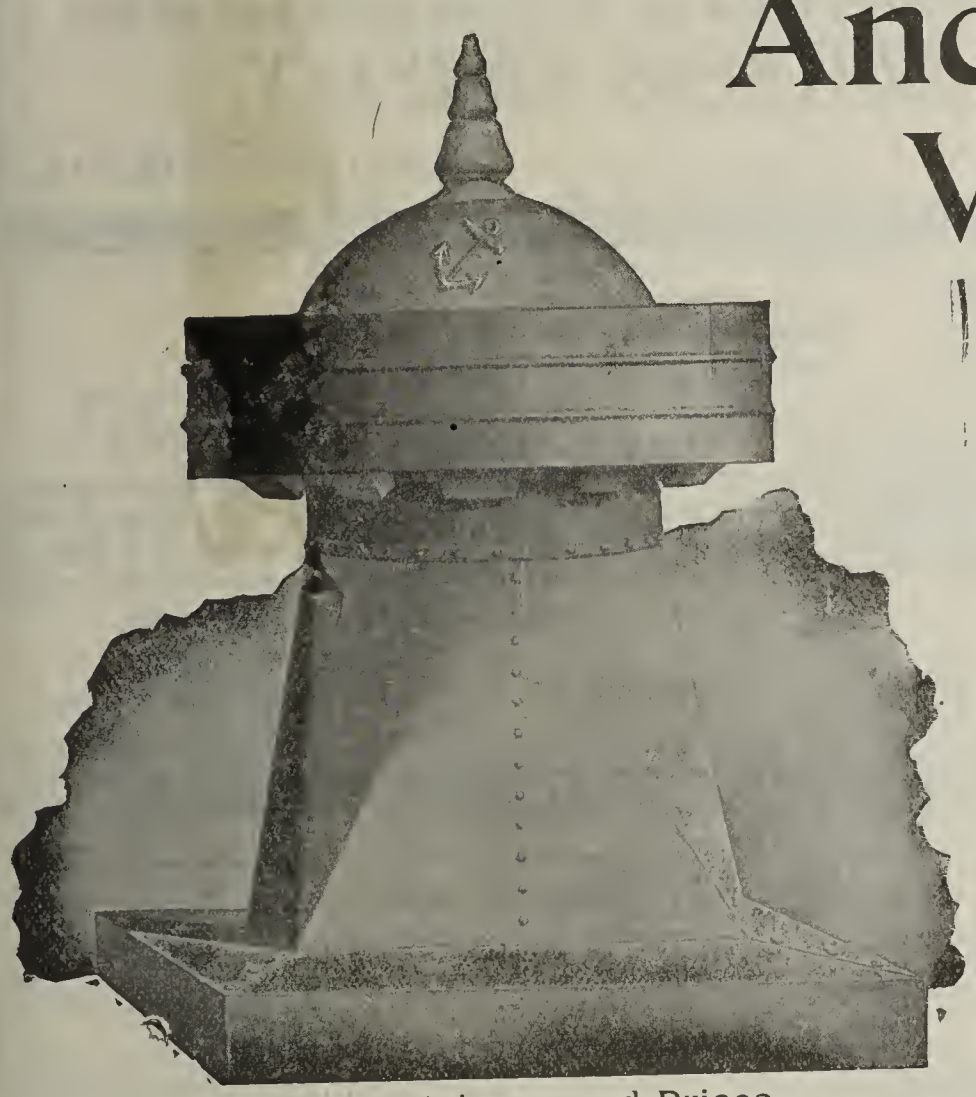
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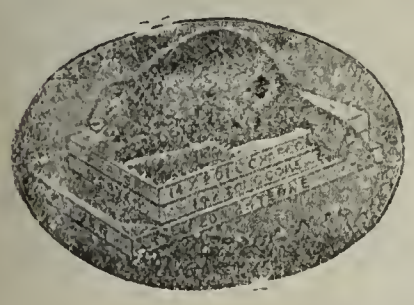
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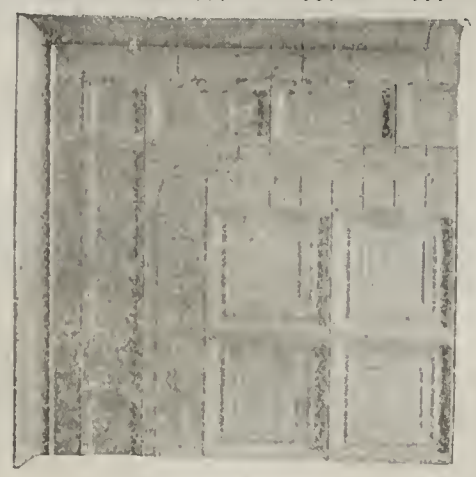
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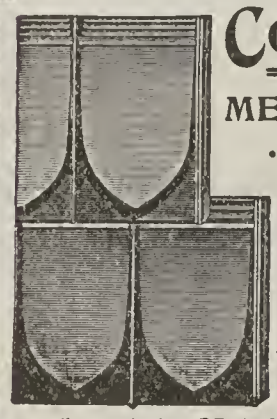
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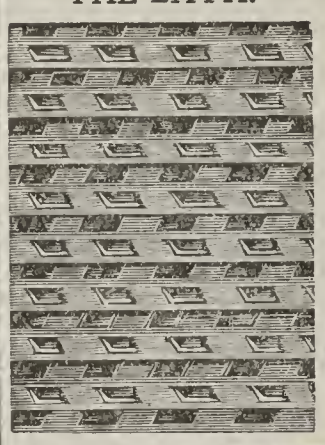
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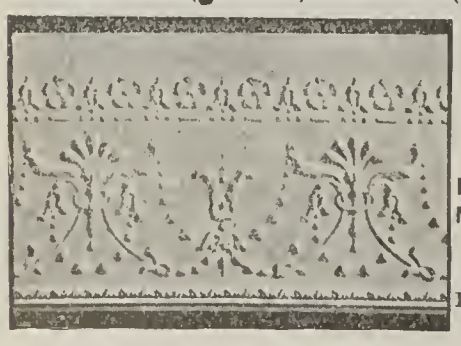
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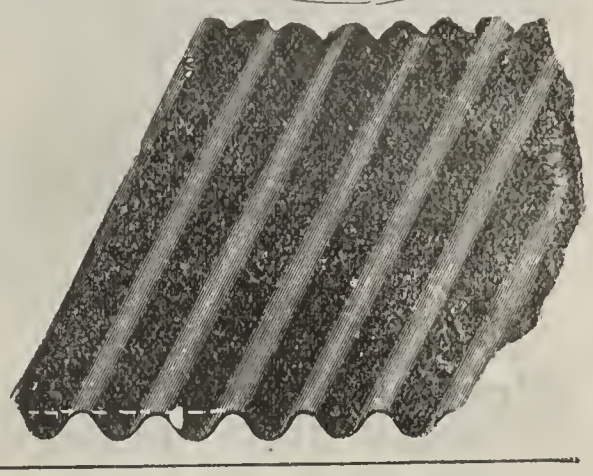
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or, how long will it last,
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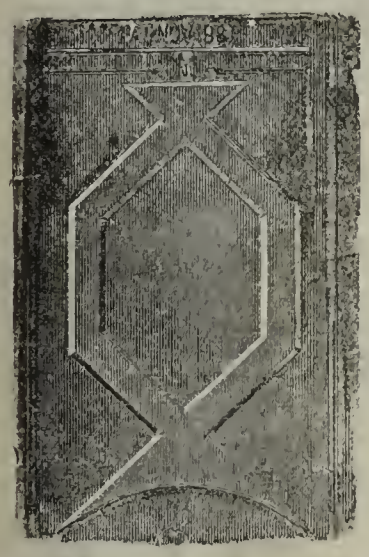
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Asbestos Furnace Cement and Stove Putty.
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J. L. PERKINS & CO., - - 243 Lake Street, Chicago.

THE other day, as I was clinging to a strap of a Lexington avenue car, two ladies sat near me, and as one opened her portemonnaie to pay her fare a scrap of paper which was pasted to the leather was disclosed.

"Is that your shopping list?" asked the other; "it doesn't look like a long one."

"No," was the reply; "it is not the list, but it is what keeps the list from being a long one," and she read:

"He who buys what he does not need will soon need what he cannot buy."

"What a capital guardian of your capital! You must let me copy that for my leaky purse. Who wrote it?"

"I don't know, but I wish I did, for he has saved many a dollar from lightly rolling from my hands since I put it there."

I was intensely interested in the conversation, for at that very moment there lay in my note book a scrap which I would have brought forth but for the fact that my own corner was reached.

I publish it, for if the truth which it contains were assimilated, many a pocket-book would remain a pocket-book.

"We are ruined, not by what we really want, but by what we think we do; therefore never go abroad in search of your wants. If they be real wants, they will come home in search of you; for he that buys what he does not want, will soon want what he cannot buy."—*Christian Advocate.*

—"Yardsley donated a caster worth 97 cents to the minister, and put a tag on it marked $16."

"Yes?"

"Well, the parson took the article to Yardsley's store yesterday and traded it for drygoods. Yardsley's smile won't be able to be out again for six weeks."—*Harper's Bazar.*



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Stamped Steel Ceilings.

CORRECT DESIGNS.
EASILY APPLIED.
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At lower prices than any other house.
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SEND FOR ILLUSTRATED CIRCULAR & PRICE LIST.


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—INURED TO HARDSHIP.—Wife—Here's a wonderful case of endurance. A fellow sat in the rigging of a wrecked vessel three days and didn't seem to mind it.

Husband.—He had probably been used to riding on an anatomical bicycle saddle.—*Truth.*

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The use of Acid Flux has been considered essential to success in making Coke Tin Plates. Atlanta Plates prove the falsity of this, however, as not a particle of Acid Flux is now used in their manufacture. Their softness makes them very easy on Can Makers' Dies.

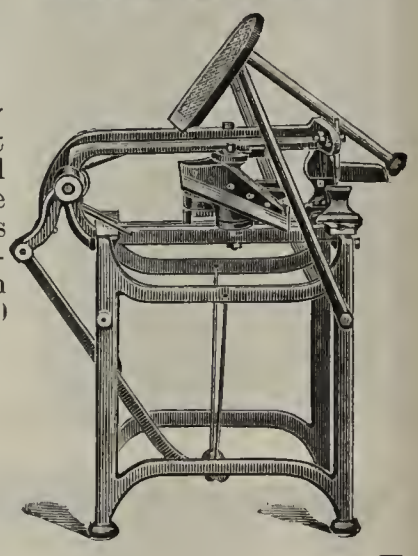
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IDEAL SLATE DRESSER.
IMPROVED FOR 1898.

Will cut **OCTAGON, HEXAGON, DIAMOND** or any other desired angle, also two sets of circle knives to cut **CONVEX** and **CONCAVE.** For ornamental work will cut and punch any sized slate from 6 to 16 inches wide and from 12 to 28 inches long and has on the bed plates figures to represent the various sizes, so that an inexperienced hand can set the machine to cut and punch o standard gauge. Will pay for itself in working 100 tquares of slate.



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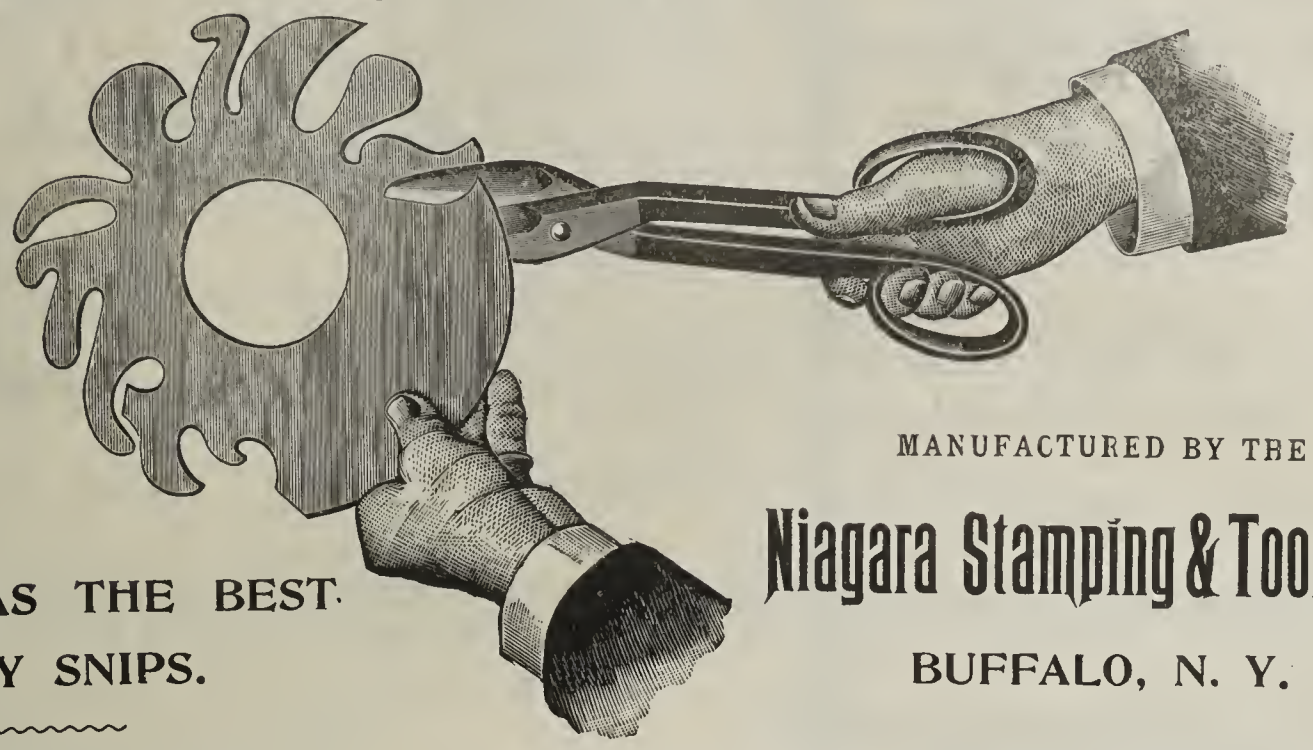
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With straight jaws and yet adapted to cutting out holes, irregular shapes, scrolls, &c.

Useful,

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Powerful



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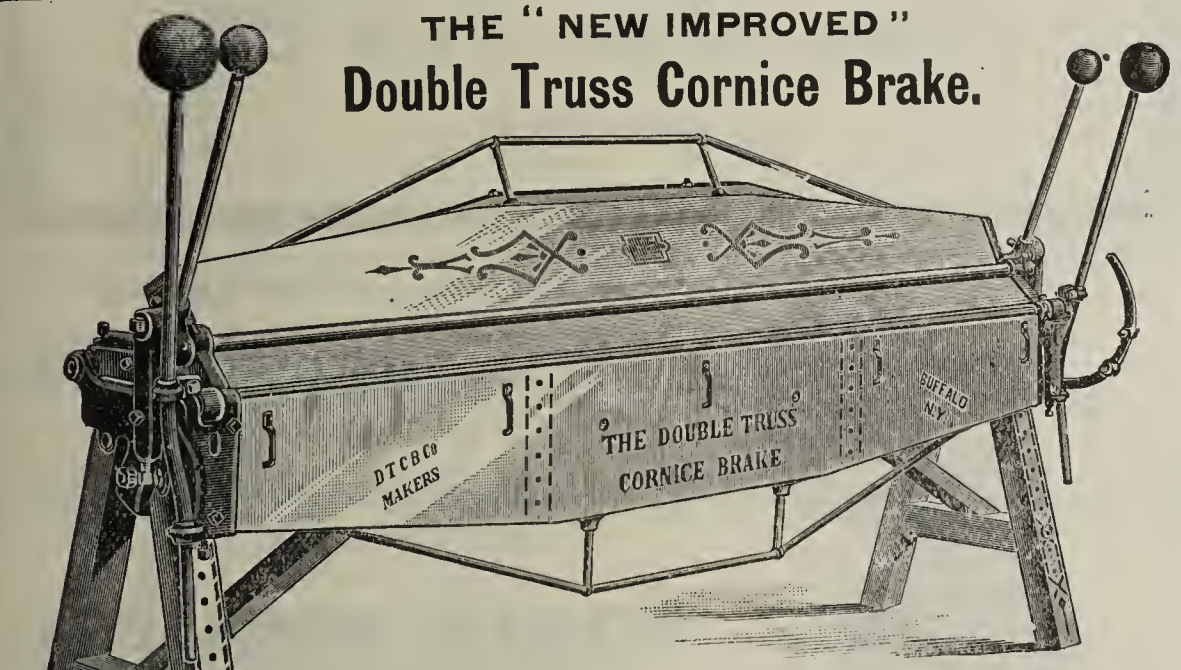
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Double Truss Cornice Brake.



Office of LUCAS BROTHERS,
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STOVES, TINWARE AND KITCHEN HARDWARE.
Gasoline Stoves a Specialty.

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DOUBLE TRUSS CORNICE BRAKE CO.,
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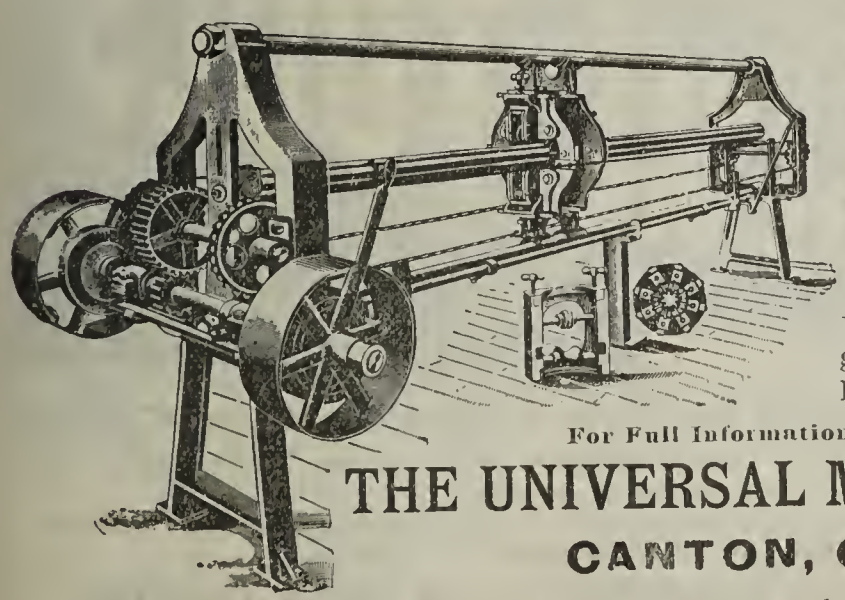
Gentlemen:—Enclosed please find N. Y. Exchange for $—— to pay for Cornice Brake sent us about six weeks ago. We never paid a bill for tools where we thought we came as near getting our money's worth as we do in paying you for this Brake. The machine is all right, and all you claim for it.

The Brake is now in a distant part of this state where our men are putting in a job of large square galv. piping. Should it get in a wreck and be lost to us, we would order another just like it at once.

All the boys in the shop are anxious to know when that Brake is coming back. For our use we would rather have this than an iron one. We are, Very respectfully yours, LUCAS BROTHERS.

All Sizes from 3 ft. to 10 ft. Indispensable to Cornice makers, roofers, tinsmiths, furnace men, etc.
Send for our latest prices.

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Improved Machines

For all Kinds of

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Which make unequaled goods in quantities surprising.

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SCHWERDTLE & SIEBERT,
STENCILS-BURNING BRANDS
STEEL STAMPS & DIES
SEALS-MACH. PLATES-CHECKS
BRIDGEPORT, CONN

—MIS' BROWN'S FUNERAL SERMON.—"If folks could have their funerals when they are alive and well and struggling along, what a help it would be!" sighed Aunt Jerusha. She had just returned from a funeral, and Mrs. J. B. Lummis pictures her in "Zion's Herald" as wondering how "poor Mis' Brown" would have felt if she could have heard what the minister said.

"Mis' Brown got discouraged," continued Aunt Jerusha. "Ye see, Deacon Brown, he'd got a way of blaming everything onto her. I don't suppose the deacon meant it—was just his way—but it's awful wearing.

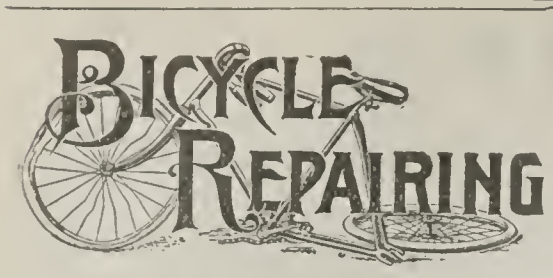
"And the minister a-telling how the deacon brought his young wife here when 'twan't nothing but a wilderness, and how patiently she bore hardship, and what a good wife she'd been! Now the minister wouldn't have known anything about that if the deacon hadn't told him. Dear! dear! If he'd only told Mis' Brown herself what he thought. I do believe he might have saved the funeral.

"And when the minister said how the children would miss their mother, seemed, as though they couldn't stand it, poor things!

"Well, I guess it is true enough; Mis' Brown was always doing for some of them. When they was singing about sweet rest in heaven, I couldn't help thinking that that was something Mis' Brown would have to get used to, for she never had none of it here.

"She'd have been awful pleased with the flowers. They was pretty, and no mistake. Ye see, the deacon wa'n't never willing for her to have a flower bed. He said 'twas enough prettier sight to see good cabbages a-growing; but Mis' Brown always kind of hankered after sweet-smelling things, like roses and such.

"What did you say, Levi? 'Most time for supper? Well, land's sake! so it is. I must have got to meditating. I've been a-thinking, Levi, you needn't tell the minister anything about me. If the pancakes and the pumpkin pies are good, you just say so as we go along. It ain't best to keep everything laid up for funerals."—*Exchange.*



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This book presents in rearranged and handy reference form a series of articles on the repairing of bicycles which has been recently published in *The Iron Age*.

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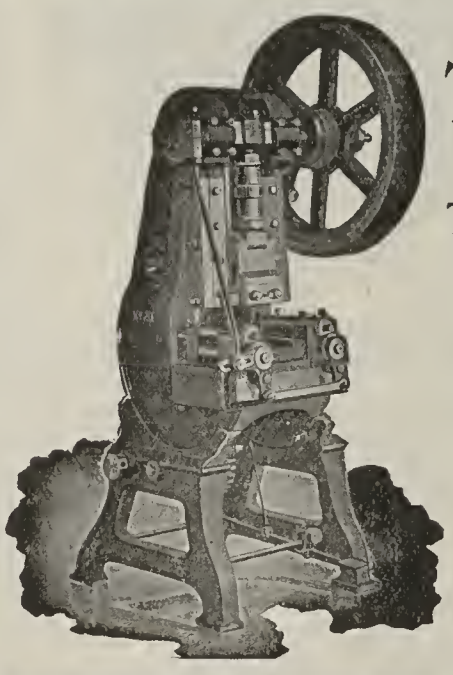
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Each sheet stamped and resquared.

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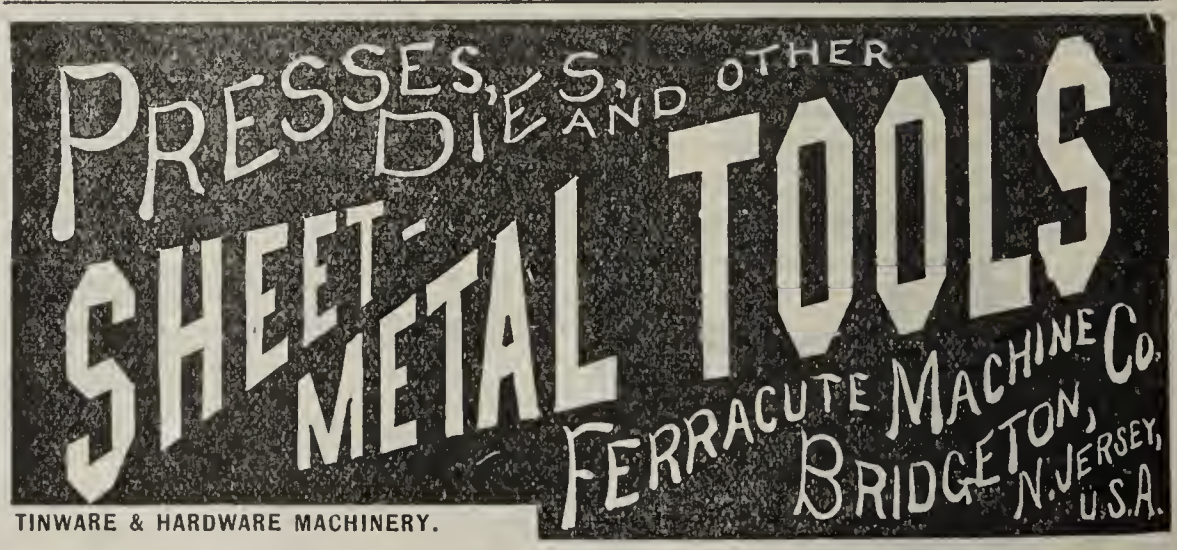
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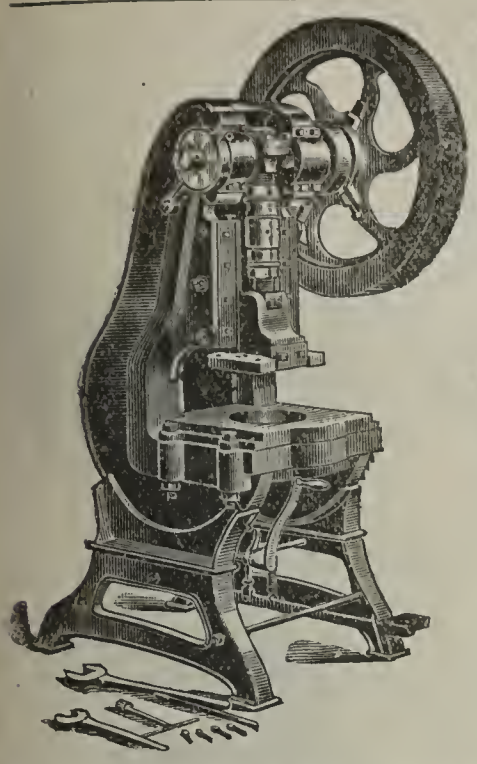


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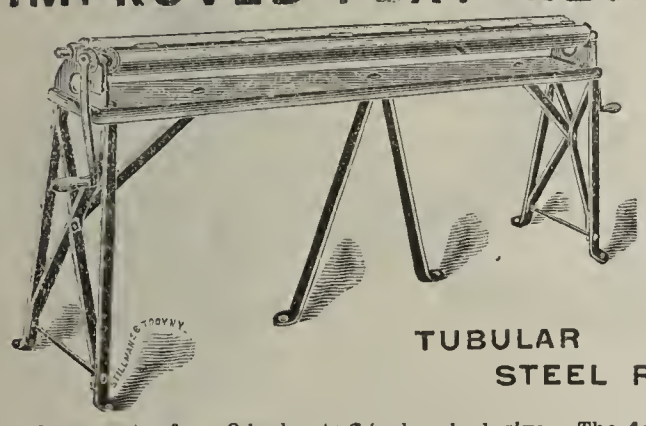
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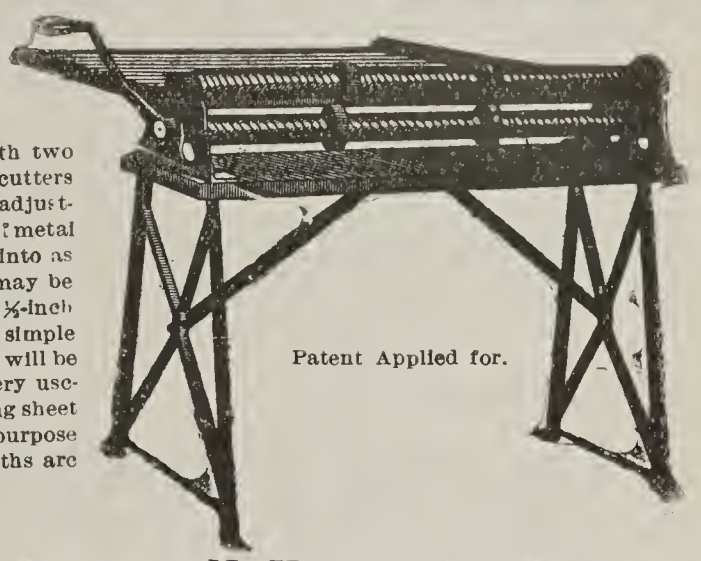
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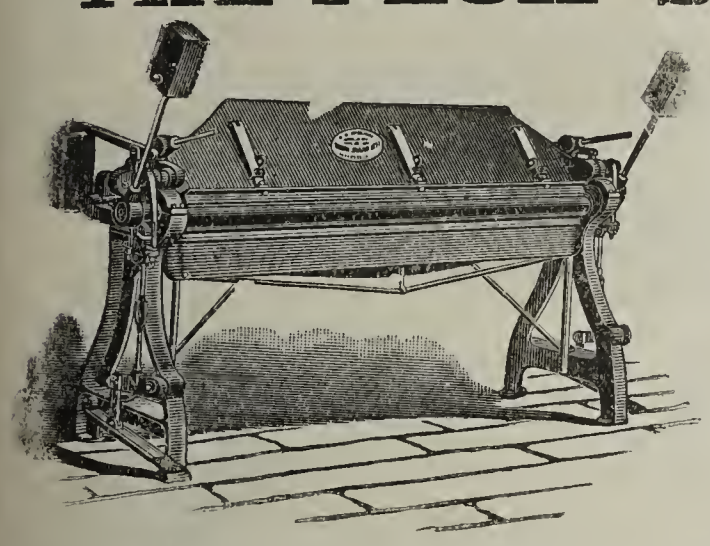
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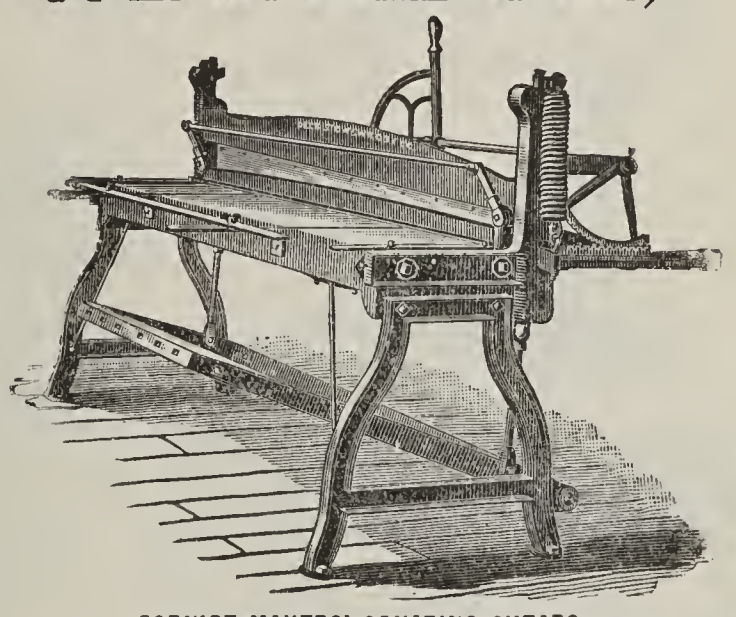
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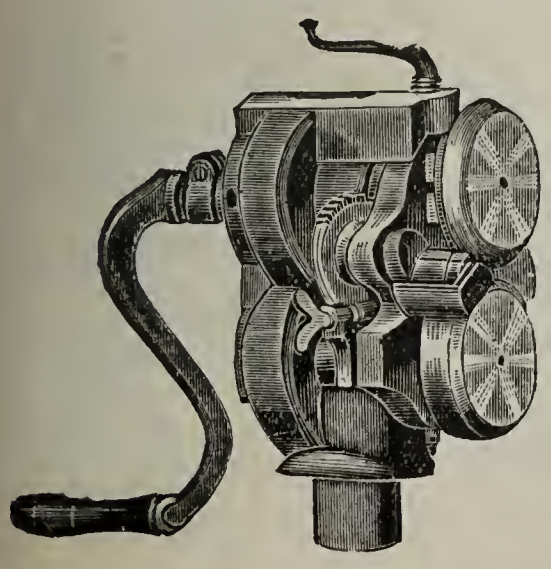
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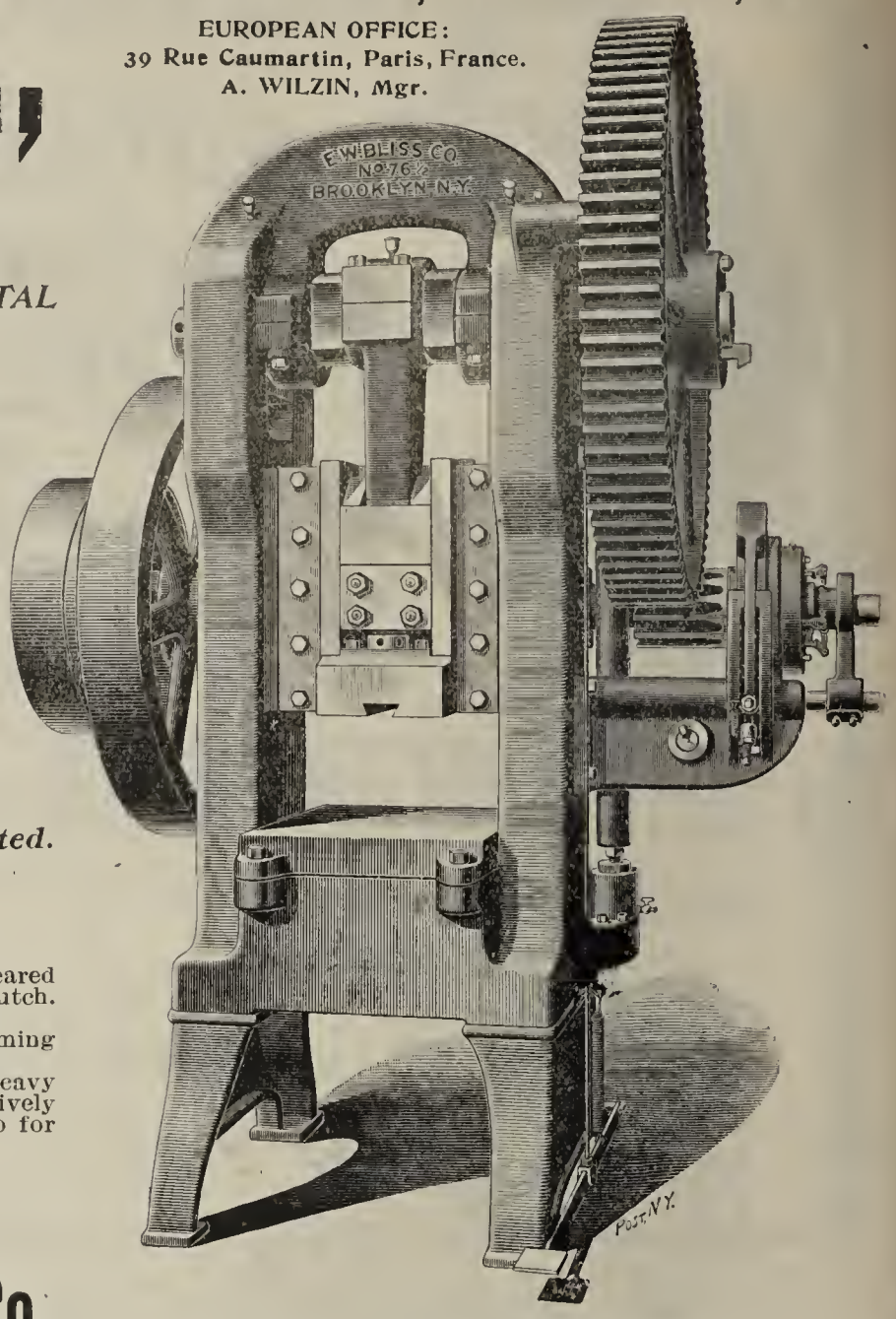
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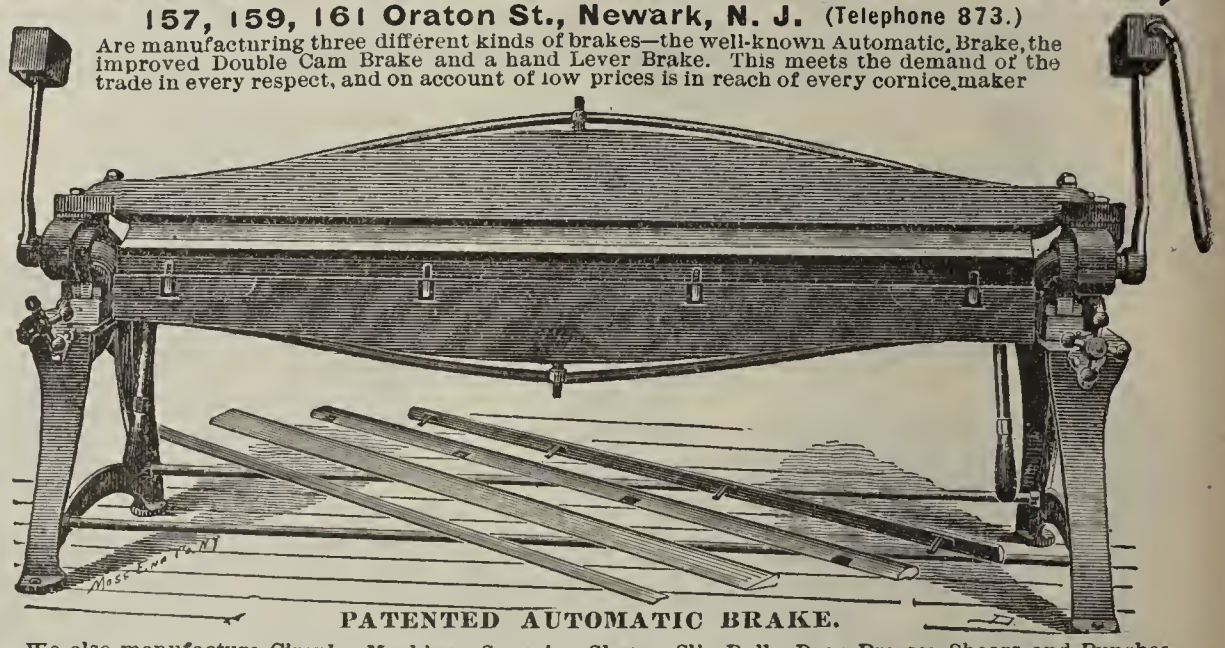
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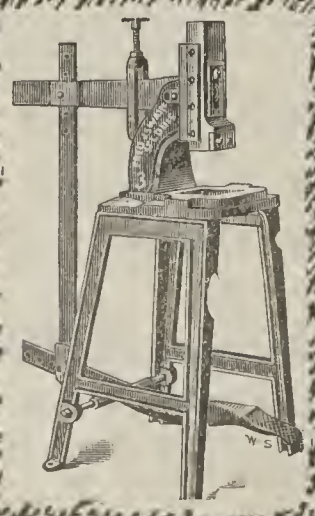
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Sheet Metal Tools.



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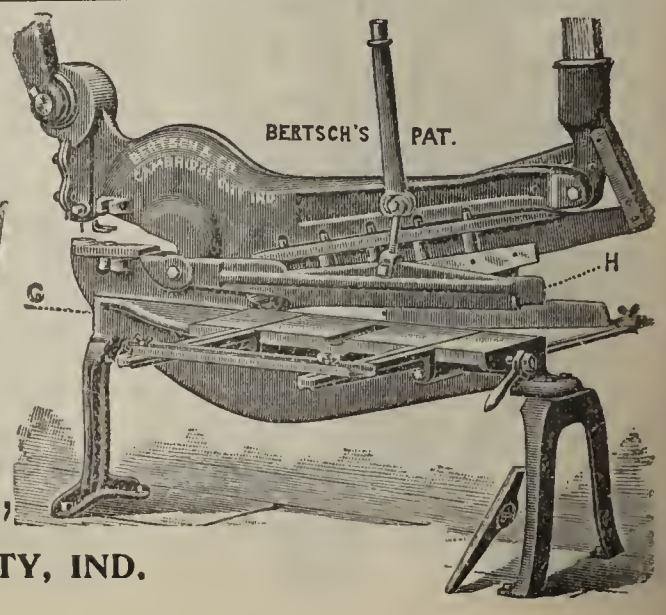
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OF EVERY DESCRIPTION

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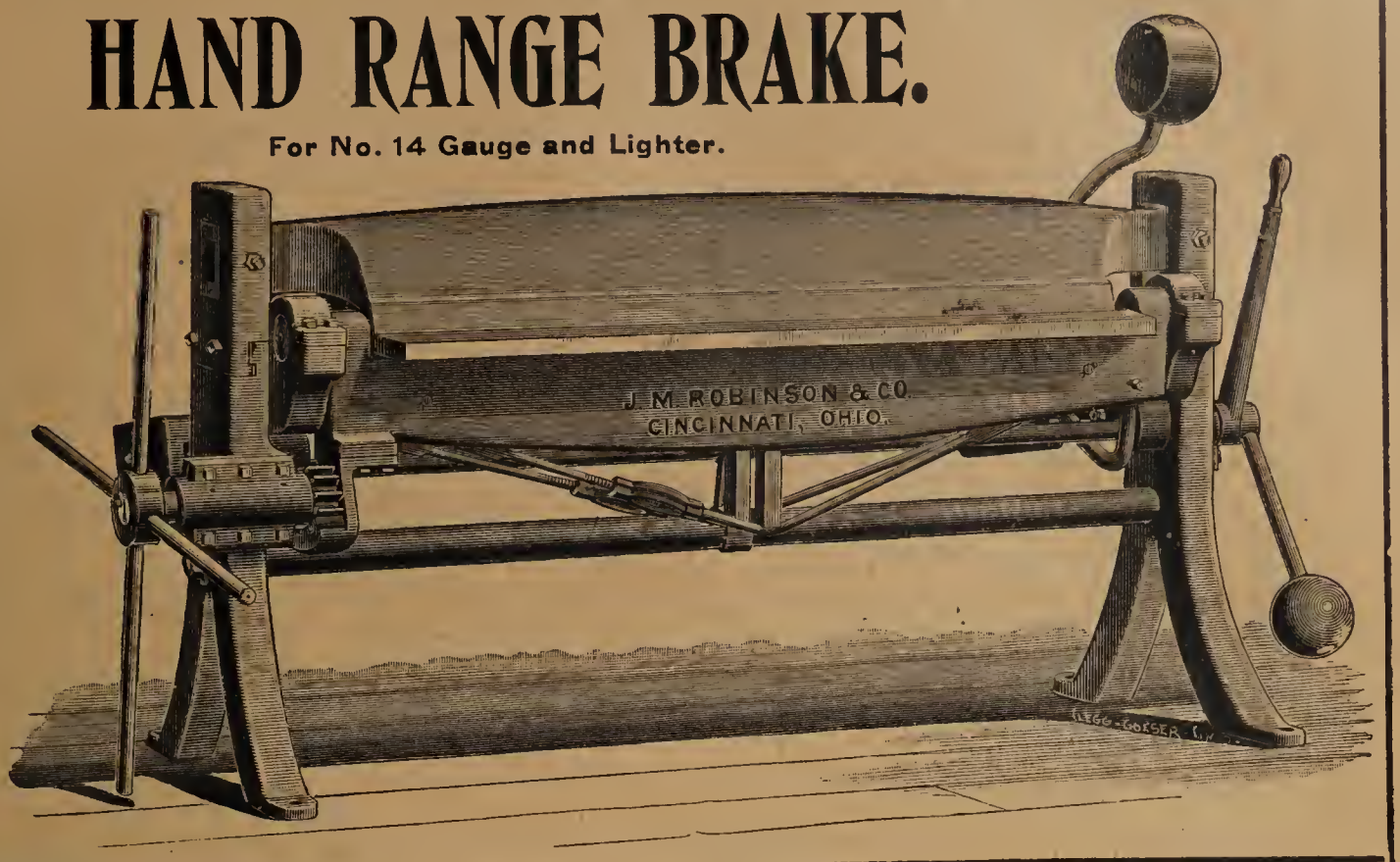
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For No. 14 Gauge and Lighter.



Possesses all the features of the power brake made from the same patterns. Bending bar is operated with a pilot wheel, and imparts great power to the bending bar through the medium of spur gearing meshing into segment attached to the bending bar. Send for complete catalogue and discounts.

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SHEET METAL TOOLS ALL KINDS.

Presses, Dies, and Special Machinery.

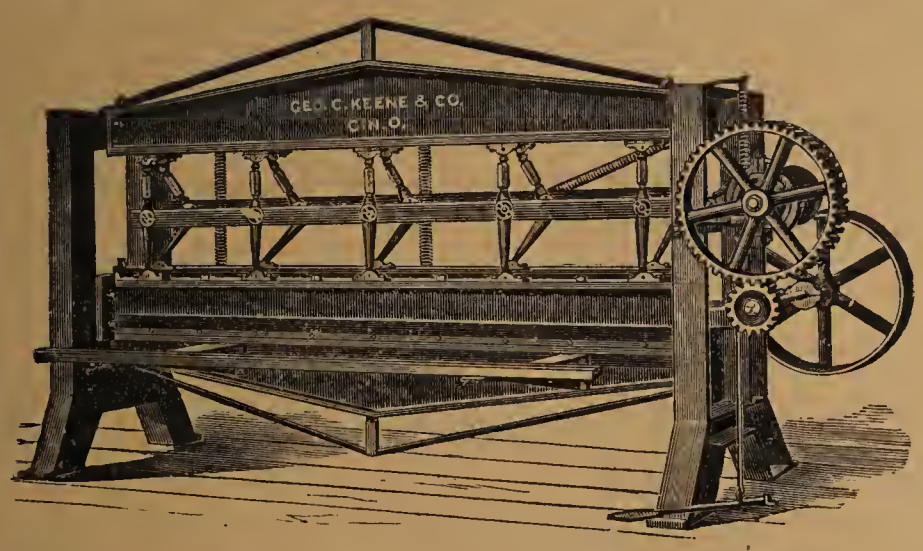
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Crimper and Corrugator.

Outfits for Iron Roofing Establishments a Specialty.

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—"MAMMA, Uncle Hipsley has lost his wife, hasn't he?"

"Yes, Johnny, long ago."

"Well, he's a widower, isn't he?"

"Yes."

"And Uncle Peddiford has lost three wives, hasnt he?"

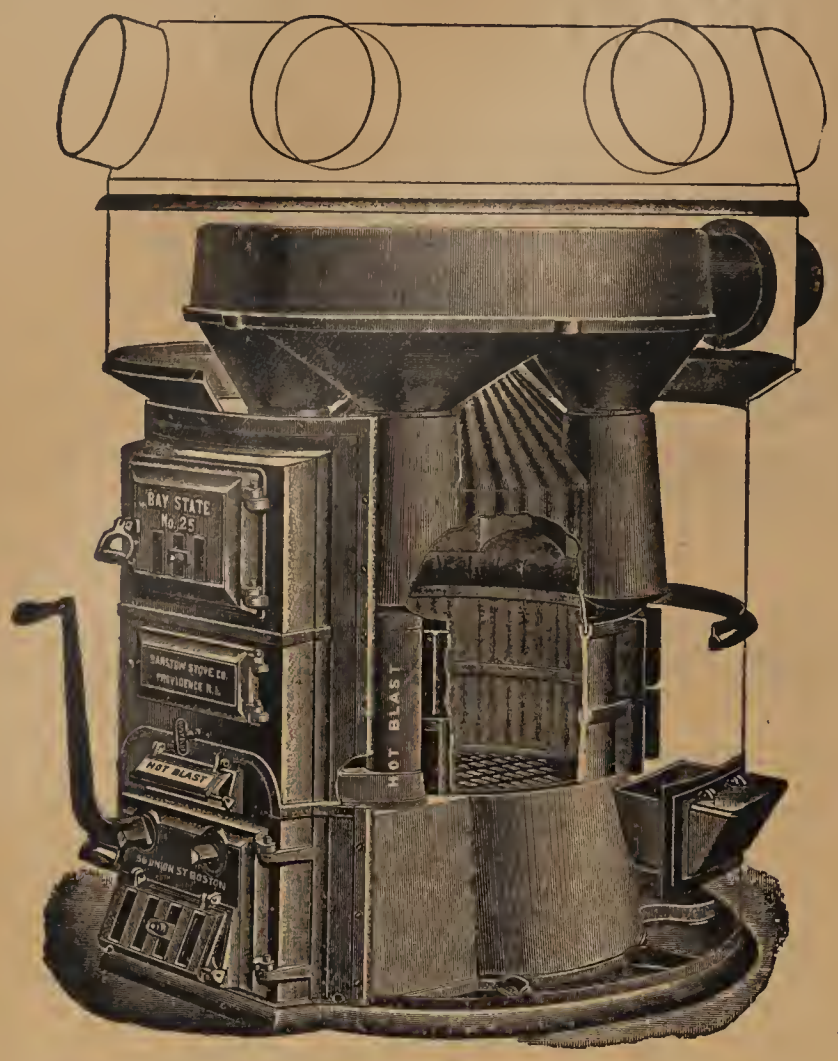
"Yes."

"Then Uncle Peddiford is a good deal widower than Uncle Hipsley, isn't he, mamma?"—*Chicago Tribune.*

—AMANDA (alighting from her wheel at the roadside, where Mortimore awaits her)—"Have I kept you waiting long, dear?"

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"In one piece, with hook. Made fro
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"Far superior to all others.

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No solder is worth buying unless it is honestly made and guaranteed. We use no metal until it has passed through an additional process of refining and cleaning. SOLDER HAS ALWAYS BEEN A SPECIALTY WITH US. It is made by our own experienced men, in our own smelting rooms, and we give our personal attention to its manufacture. Only best selected metals are used, and THE PROPORTIONS HAVE ALWAYS BEEN GUARANTEED. . . . . .

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is the improved **Family Glenwood.** So many talking points. So simple for the dealer to repair. So complete in every part. 'Twouldn't be a bad idea for you to look it over.

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We have the following sizes in stock :

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"Cupola" Brand.

Superior quality and finish. We invite correspondence before buying.

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PITTSBURG, PA., 211—213—215 Second Ave.

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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

With which is Incorporated The Stove and Tin Trade Journal, the Sheet Metal Builder, and Metal.

XLIX. BER 9. NEW YORK AND CHICAGO, FEBRUARY 26, 1898. ONE DOLLAR A YEAR. SINGLE COPIES, 5 CENTS.

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STOVE PUTTY.
FURNACE CEMENT.
ELASTIC OIL
ROOFING CEMENT.
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WILLIAM CONNORS, Troy, N. Y.

The "Gorton Side-Feed" Boilers
WILL BURN HARD OR SOFT COAL.
You Want the Best. We Have It.
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Extracts Heat and Steady Profits.

The Paragon Furnace gets every bit of heat out of your customer's coal bill that it is possible to get out of coal.

That is why it gets every bit of trade for you out of your customer that it is possible to get, if you have sold him a Paragon.

Likewise—an Excelsior Range—both money-makers for you.

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We offer special lines of Lavatories, with Plain or Decorated Bowls, ranging in price from $10.00 or $12.00 to many times these sums, and we particularly desire correspondence with buyers who wish a serviceable and modern combination at a reasonable price. Inquiries for any description of Tinners' or Plumbers' Supplies will meet with careful consideration.

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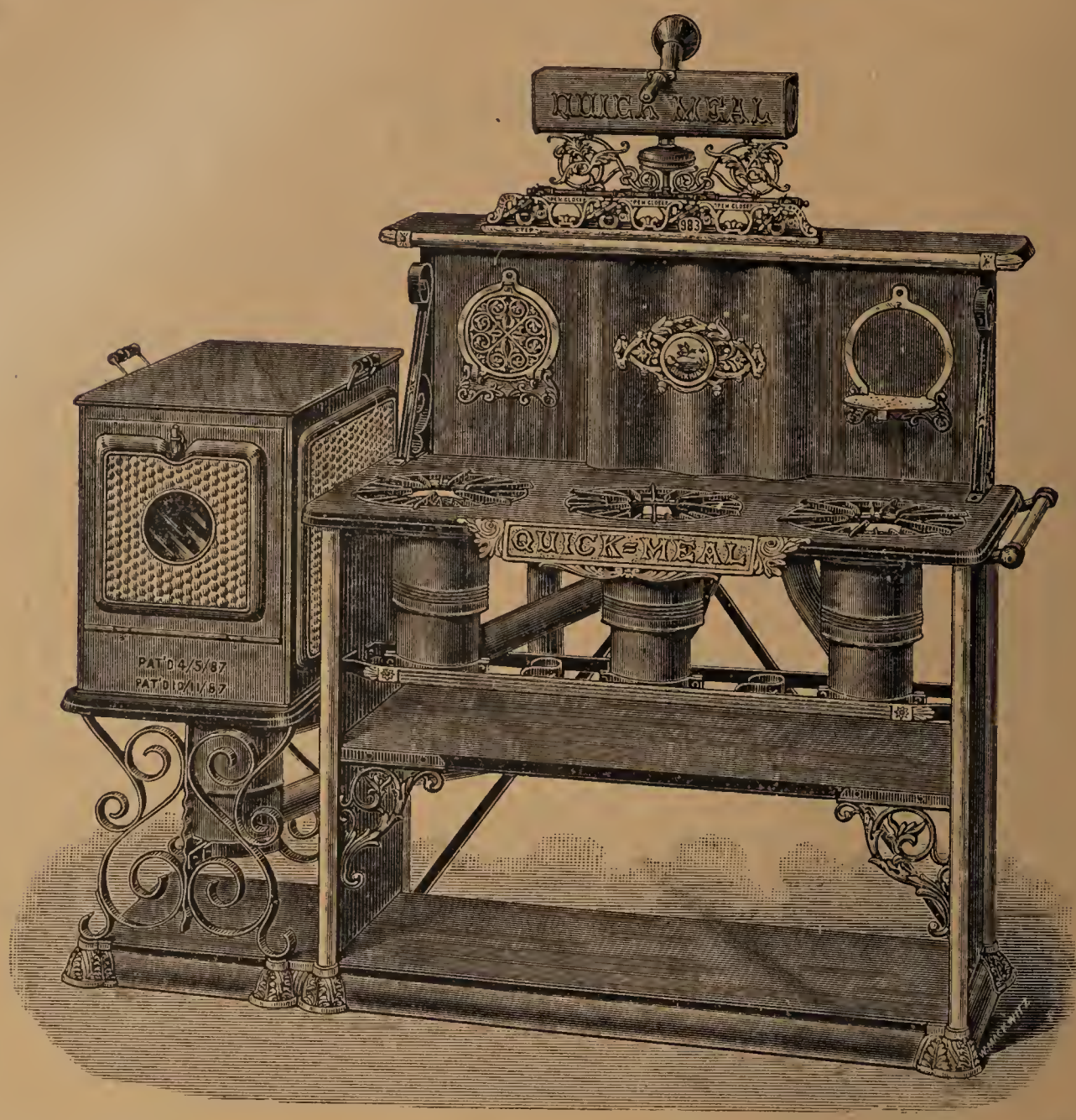
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THE MAGEE CATALOGUE
Shows a complete line of cooking and heating apparatus.
SEND FOR A COPY.
MAGEE FURNACE CO., Boston, Mass.

QUICK MEAL



A WORD ON CHEAP STOVES.

We mean so-called Cheap Stoves, which are made Cheap and sell Cheap and prove Dear to the Dealer and Dear to the User.

As well known, these cheap stoves are sold at most any price and the dealer's profit is very small indeed. It knocks out **right then** the sale of a good stove on which he might have made a fair, legitimate profit and which stove would have given his customer good satisfaction. Result: The user soon finds he needs repairs—it being sold cheap, it is made cheap—and having given out so soon he expects his dealer to furnish them free. Being unsafe it does some damage—he does not blame the stove but the dealer. He condemns Gasoline Stoves in general and his dealer in particular; he dissuades his friends from buying a Gasoline Stove of any kind and particularly buying it from his dealer. The dealer has made no profits but has lots of repairing and explaining to do and loses a customer and perhaps more than one.

What a contrast with the result of selling a **Good Stove**—a Quick Meal Evaporator, for instance—quick sale, quick profit, quick satisfaction, quick recommendation, quick additional sales, satisfaction without end to all concerned.

Yours truly,

Ringen Stove Co.

ST. LOUIS.

P. S.—The Quick Meal Steel Range is a winner. It looks well, it cooks well, it bakes well, it sells well, it satisfies well. There is none better.

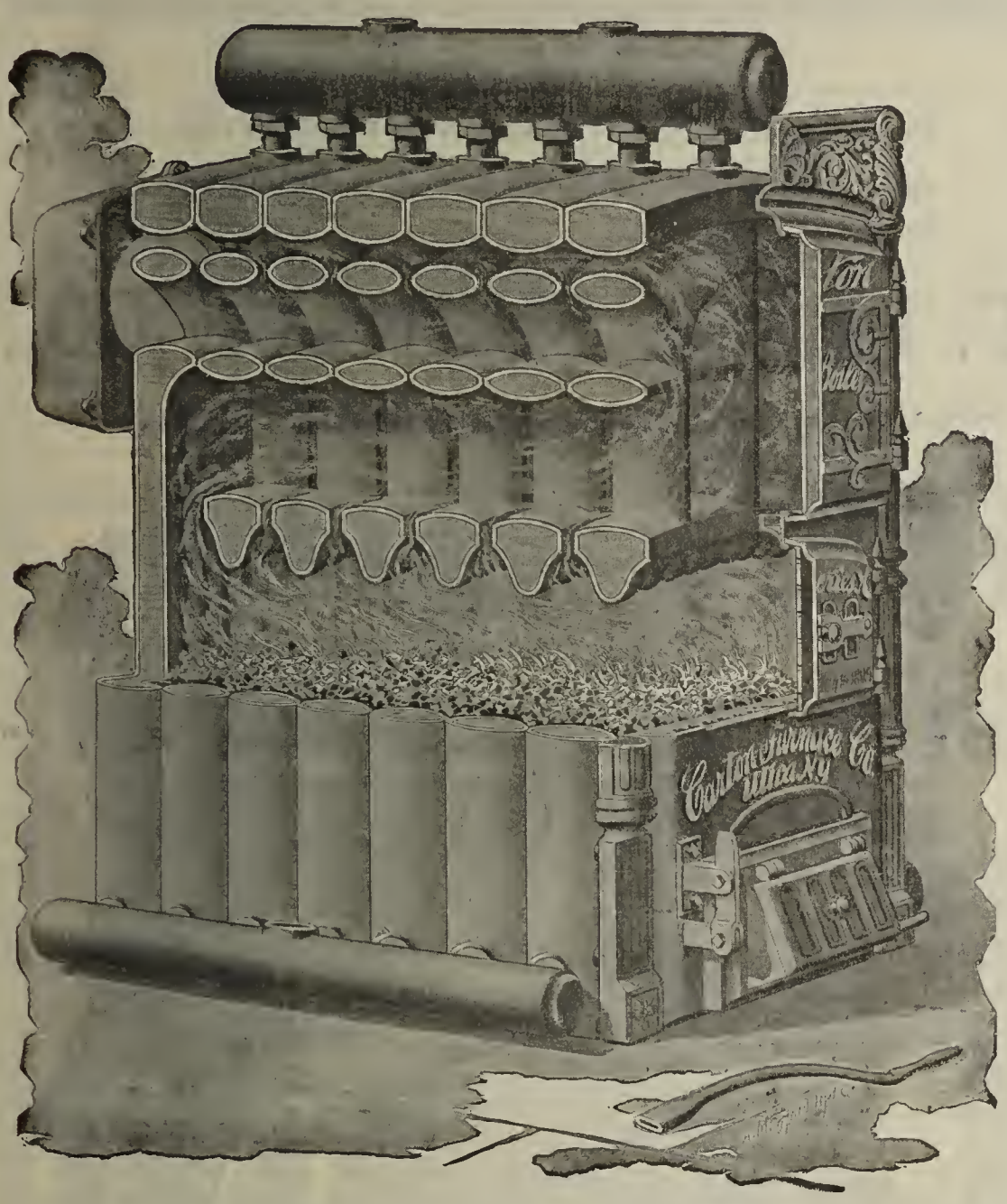
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—Effective Surface

and . . .

Our customers

Confirm our Claim.



Read!!!

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Feb. 1, 1898. }

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Dear Sirs—The No. 4 **Carton** "A" series Hot Water Boiler I placed in my residence is a **remarkably economical** heater and gives **perfect satisfaction.** I will not consume over **$6.00 worth of soft coal this winter,** being very **much less** than I have heretofore consumed to heat the same space. Your claim of **exceptionally effective surface** in your boilers is **emphatically sustained.**

Yours truly,
JACOB BRUNNER.

Write for our Golden Jubilee Boiler Catalogue.

If Interested in Hot Air Furnaces—we make a most complete line—send for Furnace Catalogue.

CARTON FURNACE CO.,

Makers of Heating Apparatus for the past *51 Years,*

UTICA, N. Y.

Warm Air Furnaces (Thirteen Patterns).

Combinations (Six Patterns).

Steel Tubular Steam Heaters.

Hot Water Heaters (Three Patterns).

600 DEALERS SELL THESE HEATERS.

The Dealers Favorite Line

ECONOMY Heaters & Furnaces

FOR Hard Coal, Soft Coal, Lignite, Coke or Wood.

Before selecting a line of apparatus to sell in 1898 ask for our prices and Catalogue—we can interest you.

J. F. PEASE FURNACE CO.,

SYRACUSE, N. Y., and CHICAGO.

PACIFIC RANGES Are Best

BECAUSE

They're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

It is made with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal; is the latest, best and handsomest Steel Range ever offered, one that you can offer as simply "out of sight" compared with that sold by the peddlers. Try it.

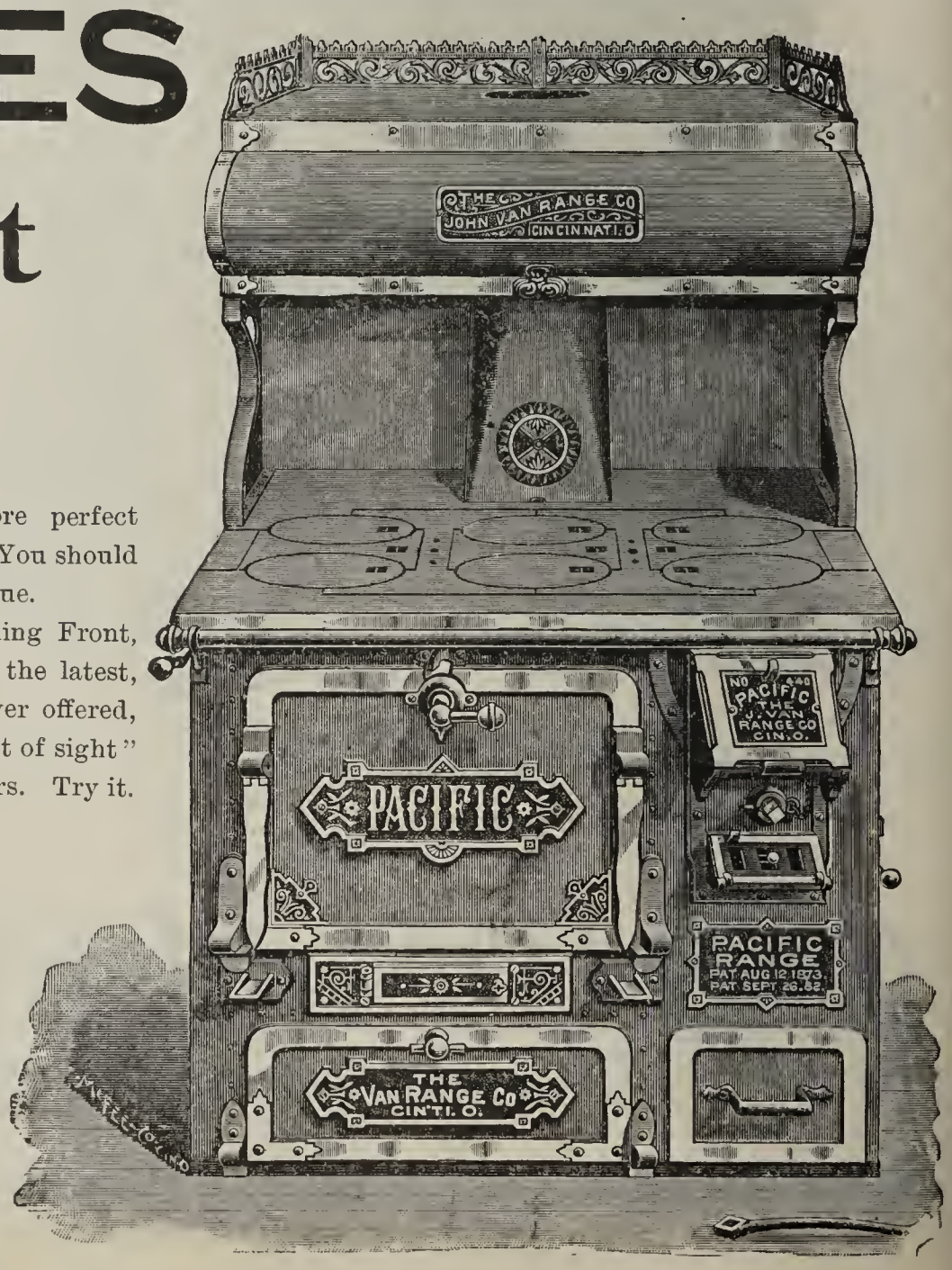
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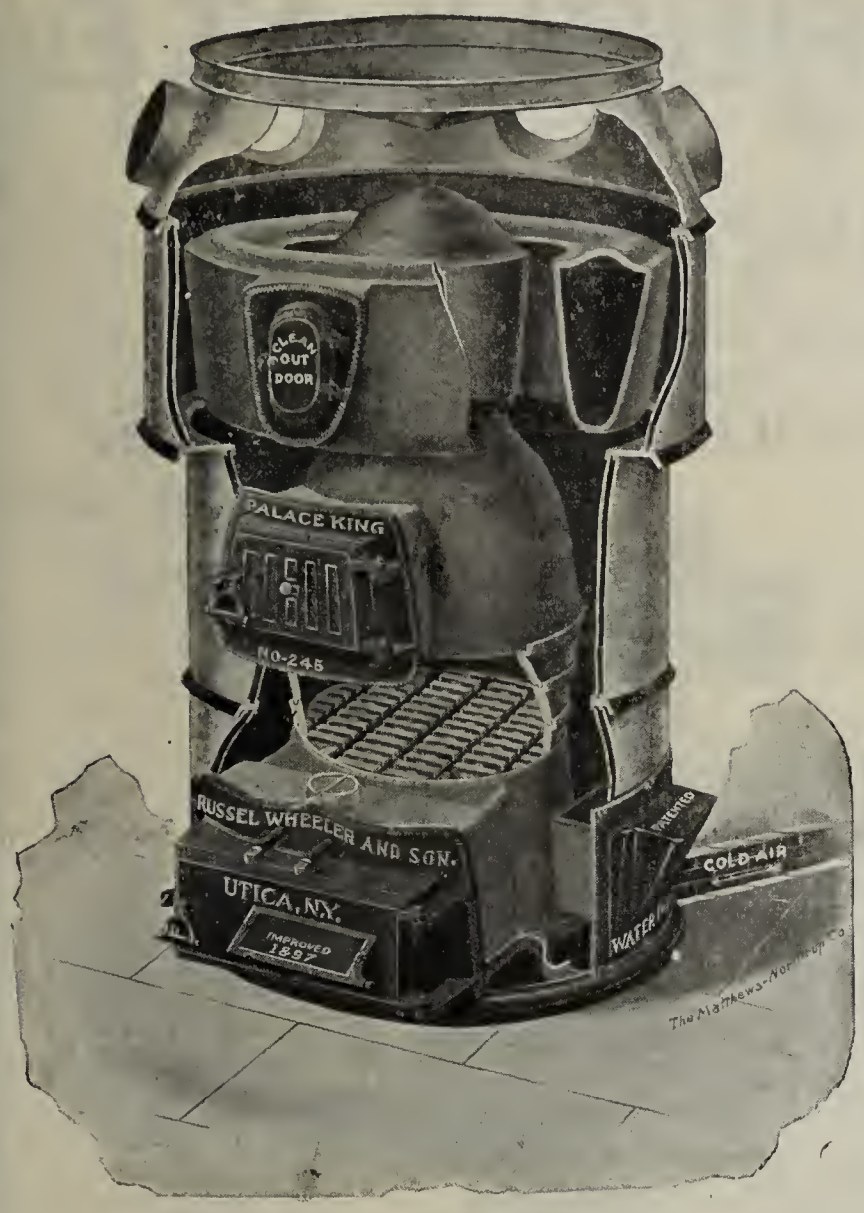
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TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.

Colonel Waring, the well known street commissioner of New York City, estimates that in 1897, ***$200,000 of coal was thrown out with the ashes into the streets of New York.*** If there is this waste in that city, it exists proportionally elsewhere.

This evil can be in a great measure avoided if proper heaters are installed and care exercised in their use.

THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,
REAL ESTATE,
HATBORO, PA.

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221 SOUTH FIFTH STREET,
PHILADELPHIA.

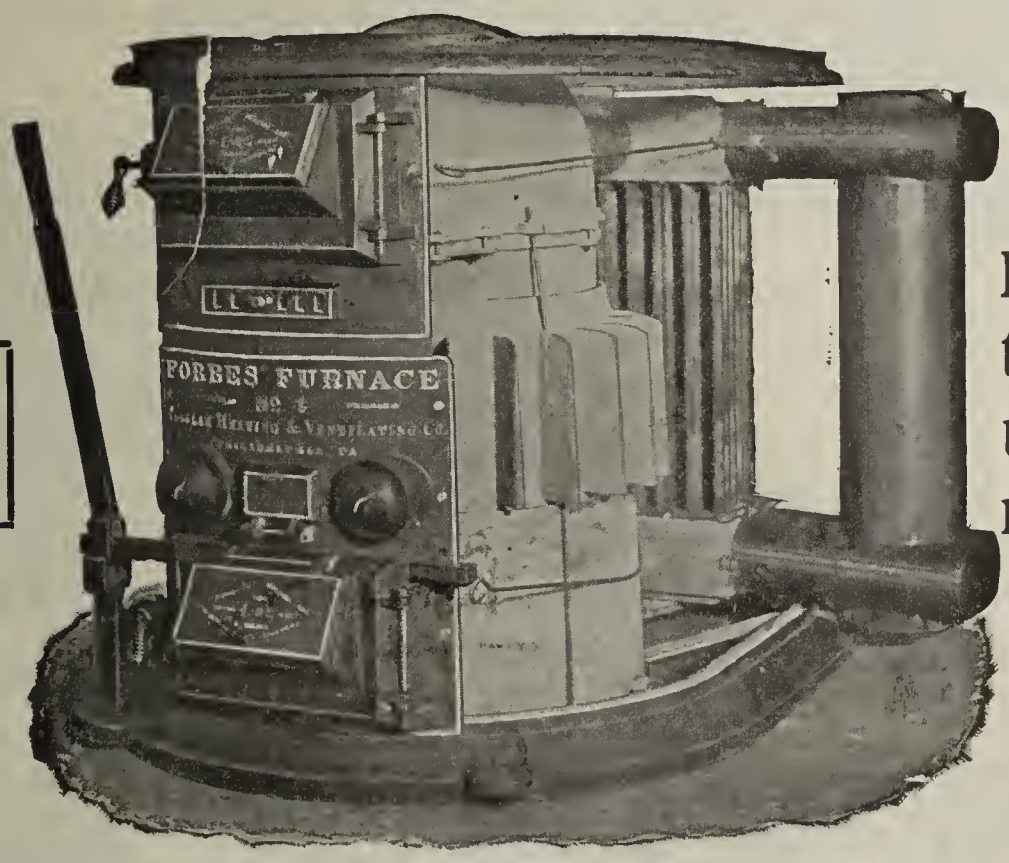
HATBORO, PA., Dec. 26th, 1896.

MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.

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In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal.

Very truly,
I. N. EVANS.



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COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

☞ Only 4 ft. 3 in. High in the Largest Sizes.

LOW PRICE.

TUBULAR HEATING AND VENTILATING CO.,

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DO NOT SPECULATE

IN

Cheap or Experimental

LINES OF

Vapor or Oil Cooking Stoves.



The average mortal has troubles enough of his own without buying those of his neighbor.

Speculation in any of the above mentioned lines will drain your purse and put you to a world of trouble.

Seeds of prudence now well sown in the selection of a line that is both complete and honest will yield a profitable and happy harvest. A good beginning for 1898 means half the battle won.

If you are interested in the handsomest line made, write for our catalogue.

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THE SCHNEIDER & TRENKAMP CO.,

CHICAGO, ILLINOIS. CLEVELAND, OHIO.

Monarch Line



"New Method,"
"Smokeless Giant Generator,"
"Smokeless Safety Junior,"
"Blue Flame Oil,"
"Asbestos Filled Oven,"

FOR 1898,

as our Trade-Mark symbolizes, is emphatically the embodiment of PROGRESS. It enters its eighteenth year of public service with the positive assurance that it has reached the high water mark of progressive development. We have made it our constant aim to incorporate into every pattern we make some original feature that will afford the pushing and live merchant an opportunity to build up a reputation for *High-Class Goods*, and to reap a profitable trade from their sale.

A most critical examination of every article we show will convince you, Mr. Stove Dealer, that "the *MONARCH* line is all right."

We will be glad to submit a line of samples for your inspection.

Yours very respectfully,



The Monarch Stove and Mfg. Company,

MANSFIELD, O.

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GAS STOVES.

ARE YOUR ORDERS IN?

The Gas is Heated and Expanded Before Burning. This Means Economical and Hot Flames.

The Valves which Control the Flames Have Blunt Ends and are Practically Indestructible.

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SOLE MANUFACTURERS,

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Only a Few Days now and We Begin Shipping Samples.



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ARE YOUR ORDERS IN?

Have You Secured . . . .

. . . . an Agency

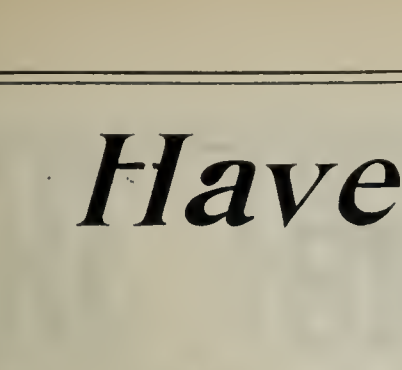
. . . . FOR THE . . . .

Puritan Wickless

BLUE FLAME OIL COOKING STOVE?

The SIMPLEST and Most Perfect in Operation.

BURNS COAL OIL (Kerosene) OR GASOLENE.



Only 3 simple parts to the burner.



APPLY EARLY and secure the sale of the BEST.

Agencies are going fast.

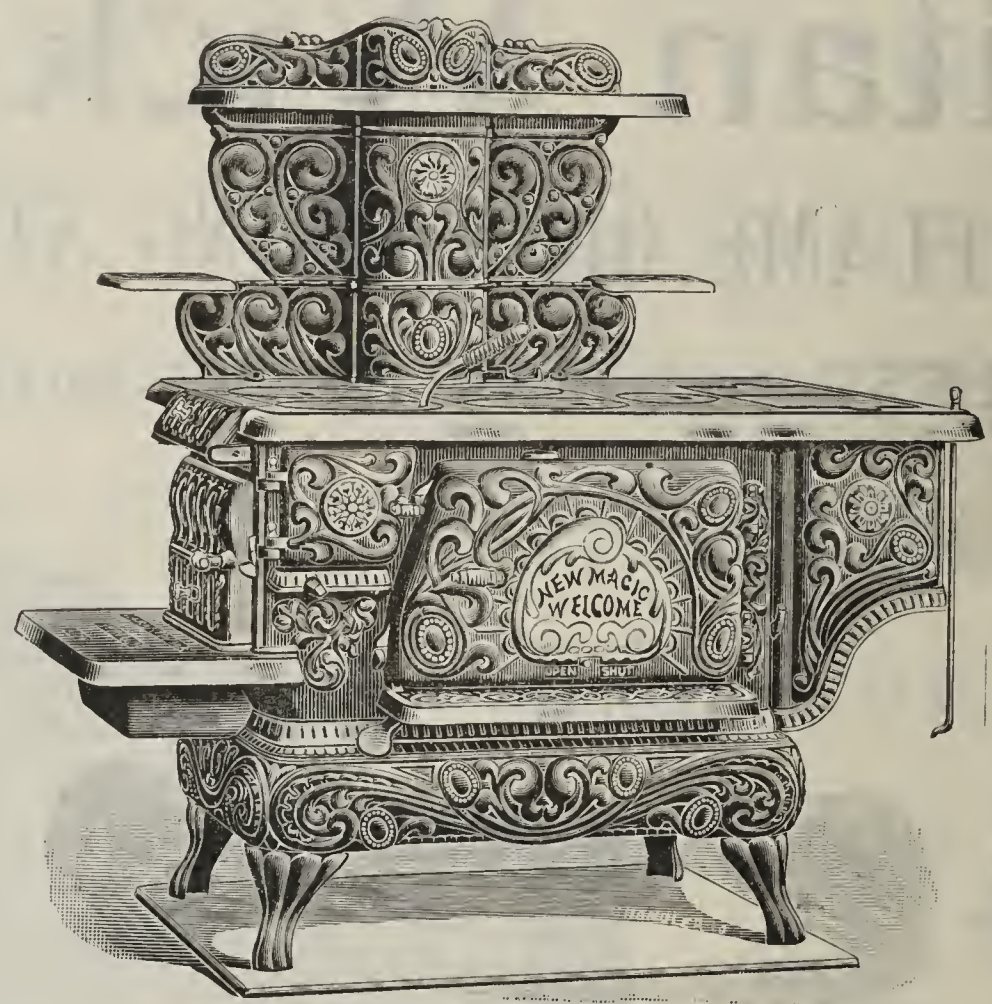
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CLEVELAND. BOSTON. SAN FRANCISCO, 132 Market Street.

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Stoves and Ranges



Already Famous.

New Magic Welcome Range.

Beans: We bake them nicely browned, Boston style.

Potatoes: With their jackets on to suit an epicure.

Bread: That charms and delights the new wife. No complaints or comparisons by the contented husband.

Cakes and Pastry: So quickly that our visitor says, "You are a magician." We answer, "Oh, no; we use a Magic Welcome Range."

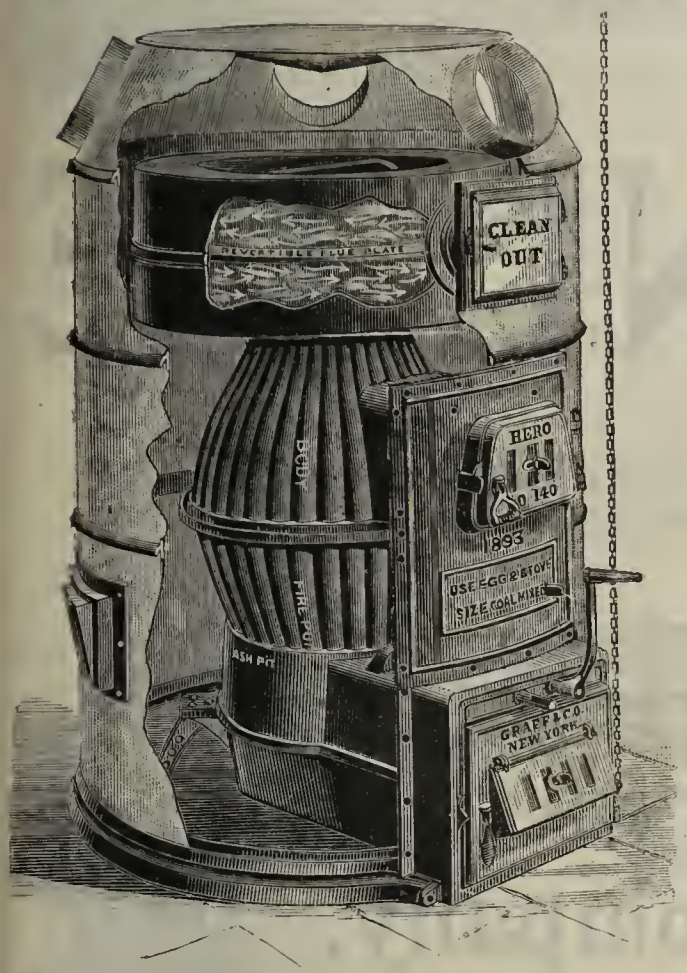
Staff of Life: Every dealer who wants bread winners please write. Our prices and terms are the best.

Syracuse Stove Works,

Syracuse, N. Y.

Branch Office---No. 105 Beekman St., New York City.

THE HEROES of the NAVY



Are Now the Admiration of All.

HERO FURNACES

Are praised by all who use them—and their name is ***legion.***

This cut shows only the all-cast Hard Coal Style—made in ***six sizes—32-inch*** to ***60-inch*** casings.

Fully equipped with all modern improvements. Heavy Castings. Largest amount of Radiating Surface.

None Better at any Price!

GRAFF & CO., Manufacturers of Furnaces and Ranges,

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THE MOSTEST GOODS FOR THE LEASTEST MONEY. . .

The Stove is "all right" and we can prove it to you by sending you a sample. It is ***"Lansing"*** the trade of our contemporaries and orders are pouring into the ***"Grand Haven,"*** where we take care of them promptly.

THE WOOD QUEEN,

WITH BRACKET RESERVOIR,

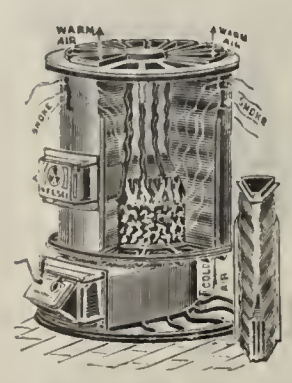
is a great big well made wood stove that is beautiful in design and modern in every respect. We have the first time to place a sample that has not brought in a nice order. Send for prices and secure the agency for your town.



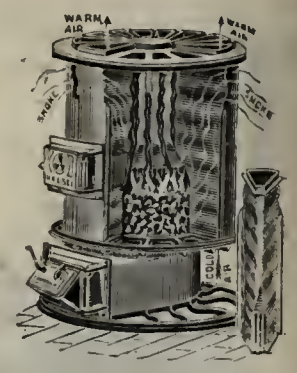
The Portsmouth Stove & Range Co.,

Busiest makers of Stoves and Ranges in the world,

Portsmouth, Ohio.



JUST ONE MINUTE



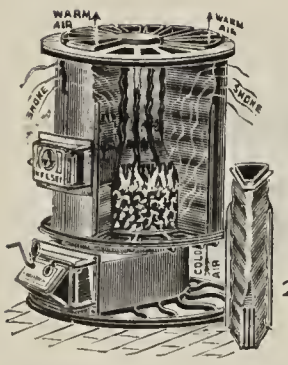
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Massachusetts State Inspector,
Heating and Ventilating
Public Schools.

BOSTON, MASS., Feb. 16, 1898.

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GENTLEMEN: The Kelsey Generator you placed in my residence has given most excellent results. It thoroughly warms all parts of the house in the coldest weather, and is very economical in use of fuel.

My experience with different Furnaces caused me to select a "Kelsey Generator" for warming my own home. Very truly yours, JOSEPH A. MOORE.

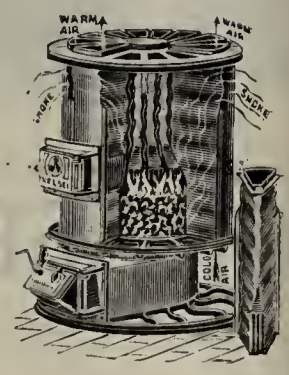


FOR CATALOGUE AND PRICES, WRITE

Kelsey Furnace Company,

SYRACUSE, N. Y.

239 Water Street, N. Y. City. 173 Lake Street, Chicago. Ills.



JAMES SMART MFG. CO., Brockville, Ont., Manufacturers for Canada.

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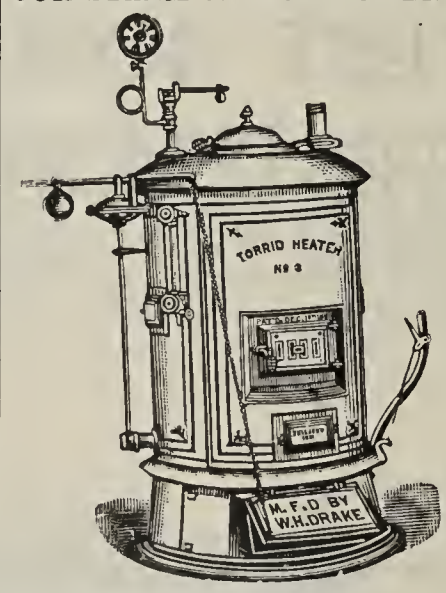
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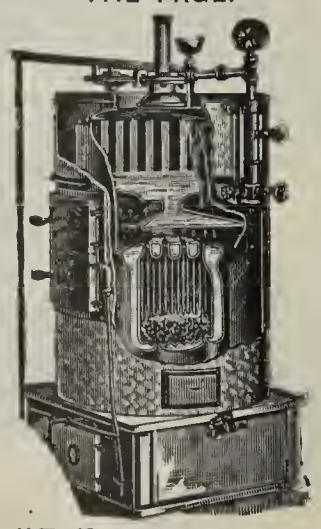
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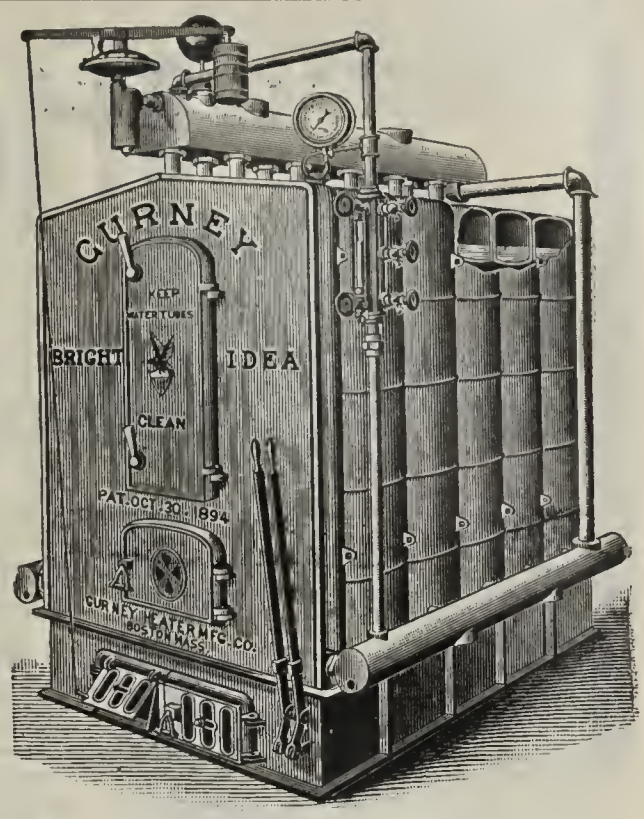
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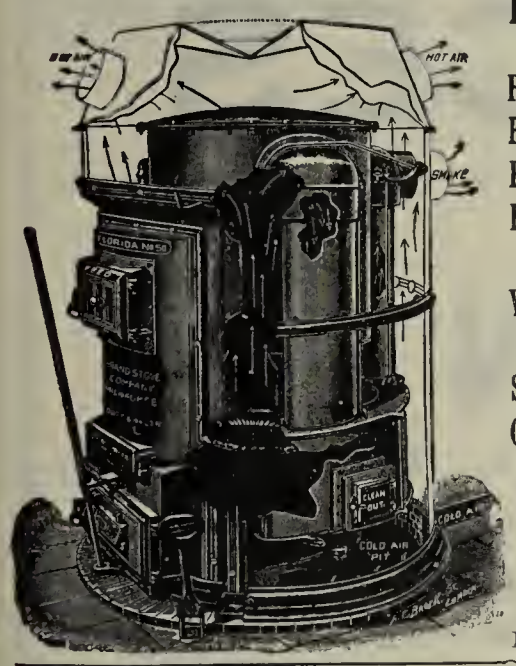
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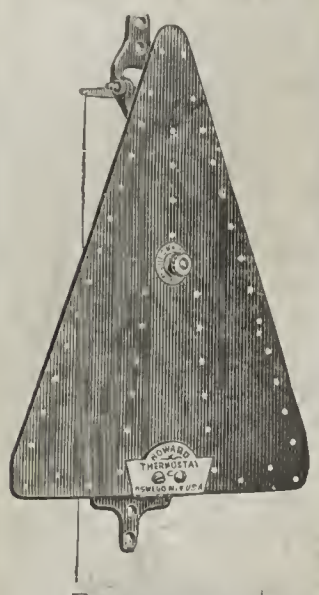
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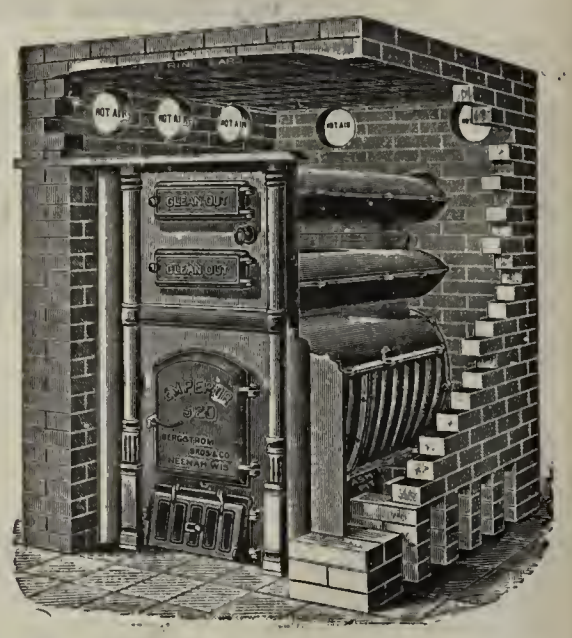
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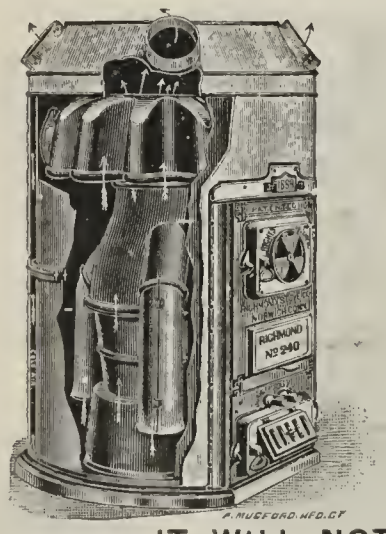
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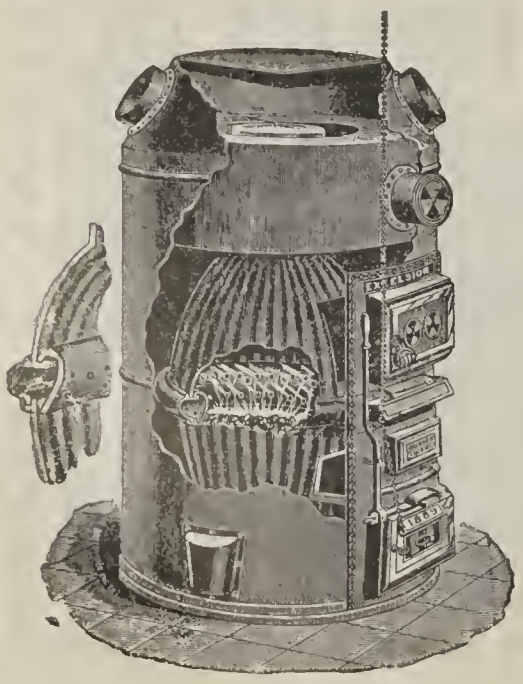
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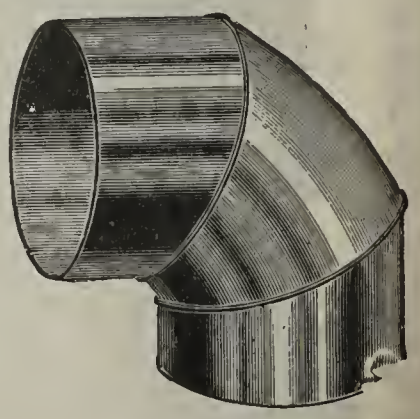
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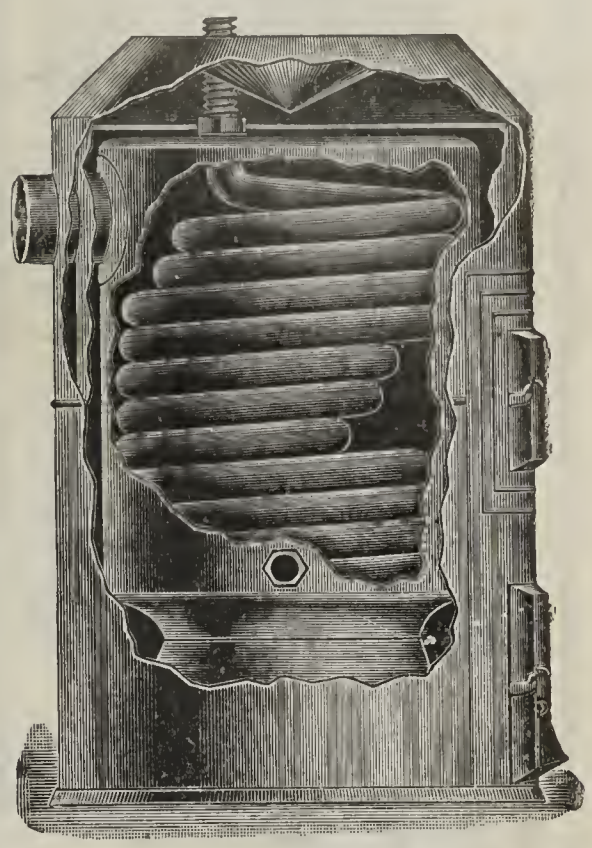
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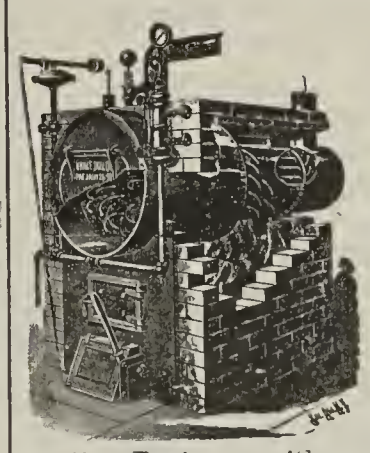
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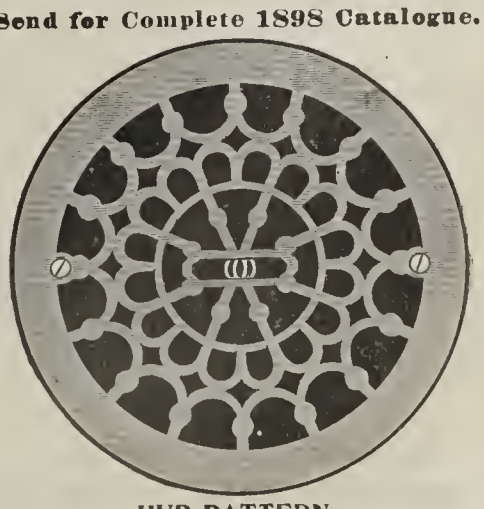
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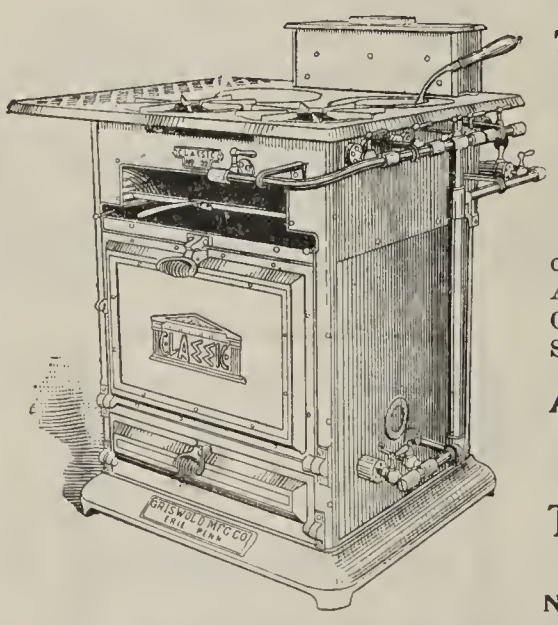


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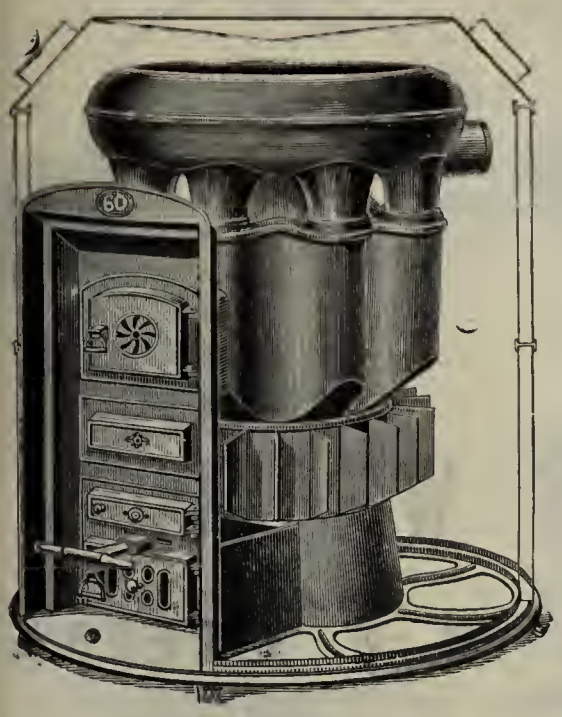
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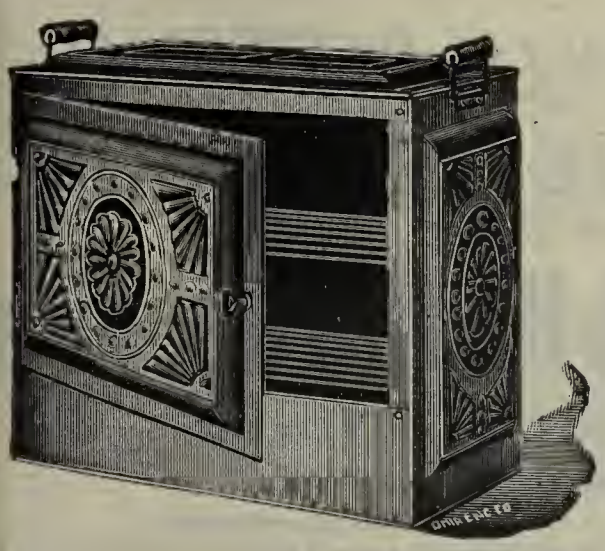
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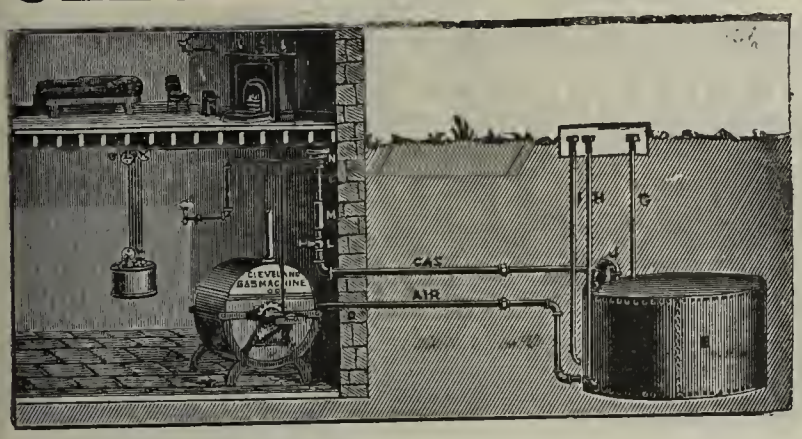
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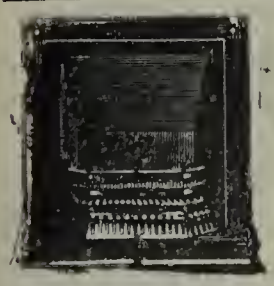
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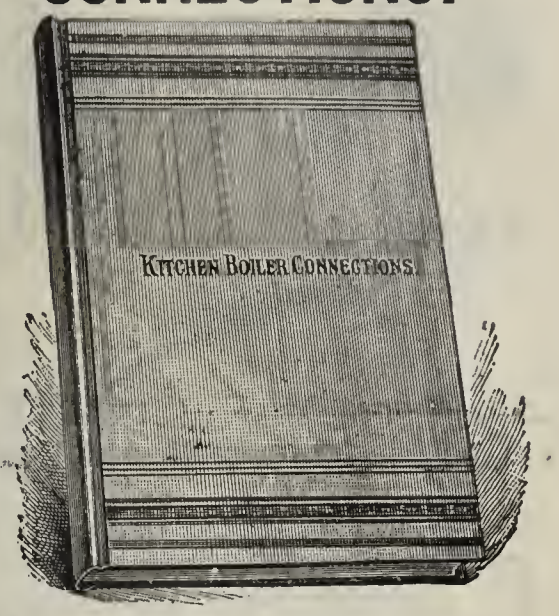
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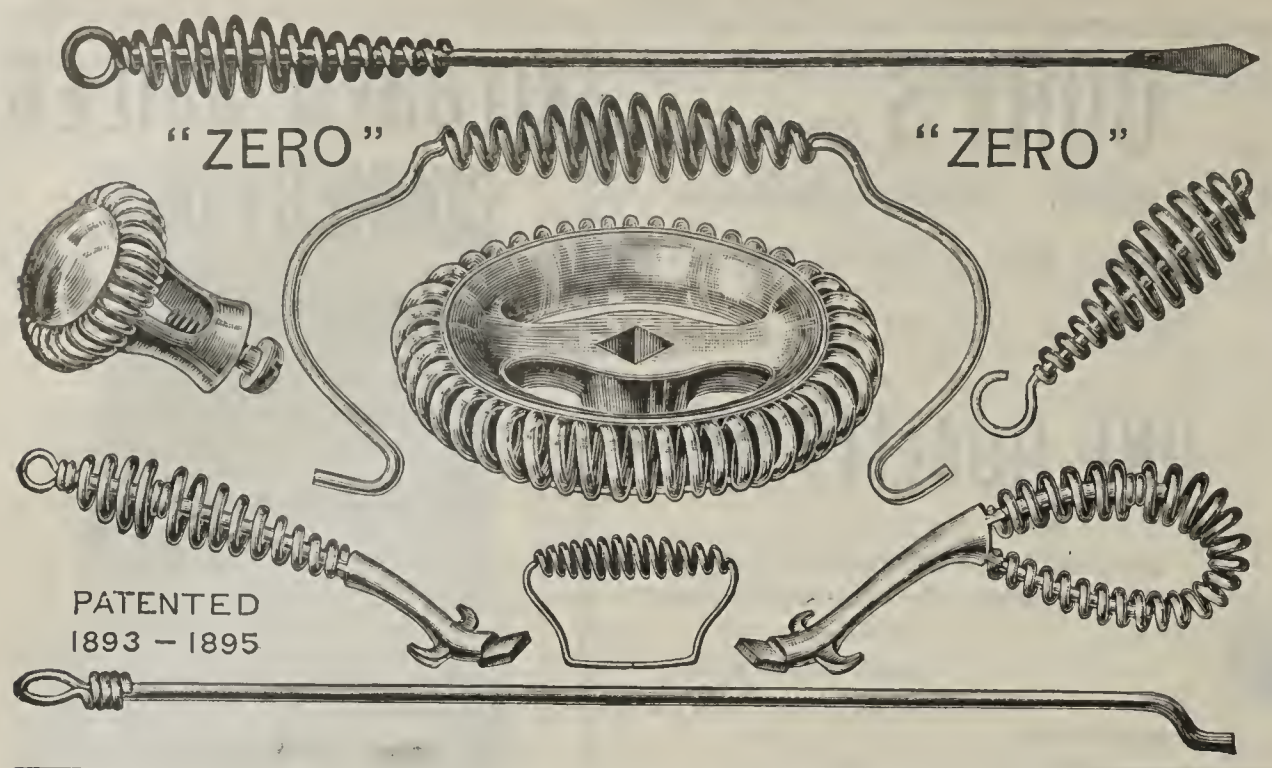
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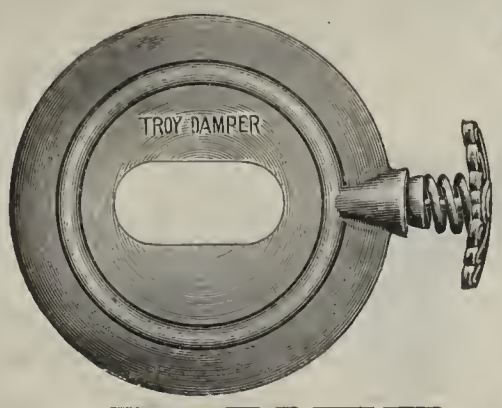




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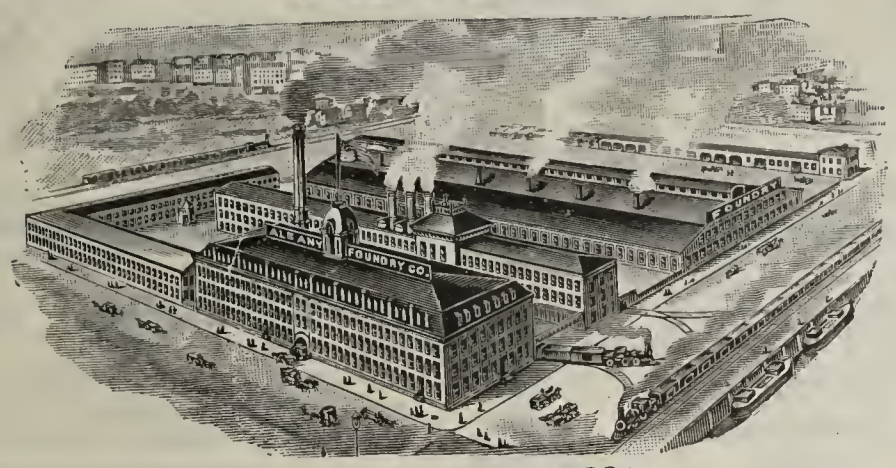
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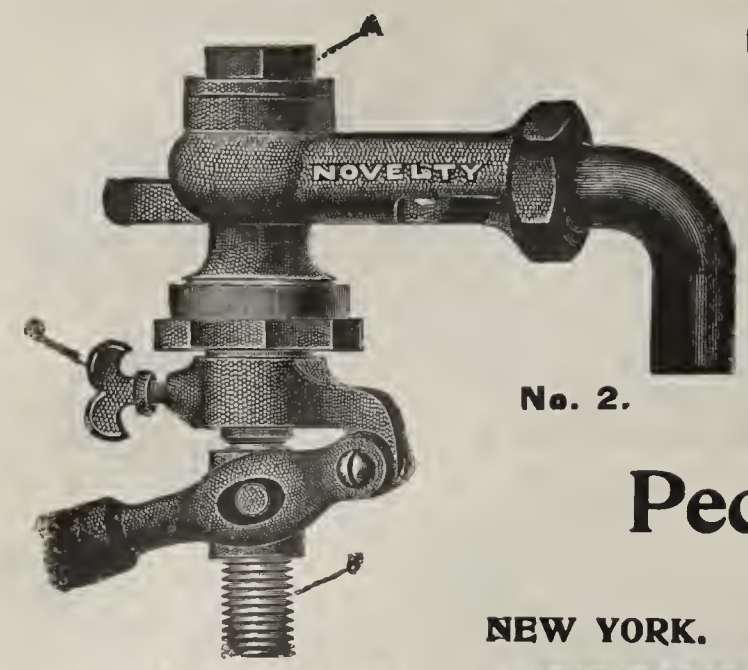
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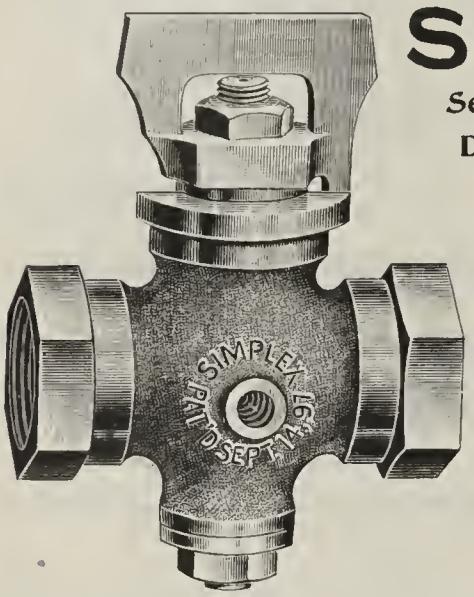
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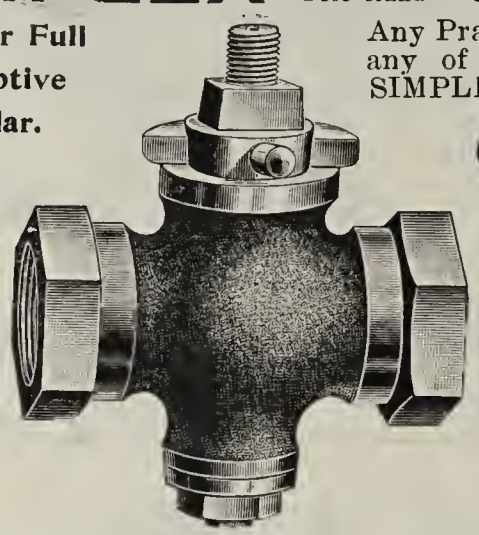
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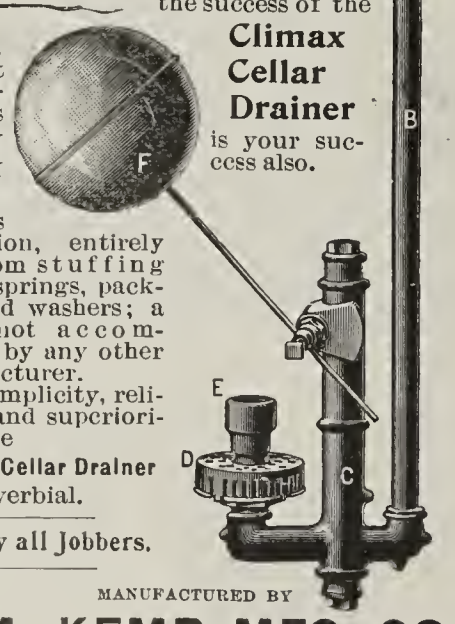
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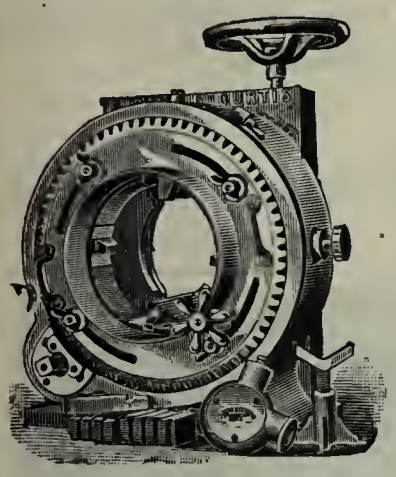


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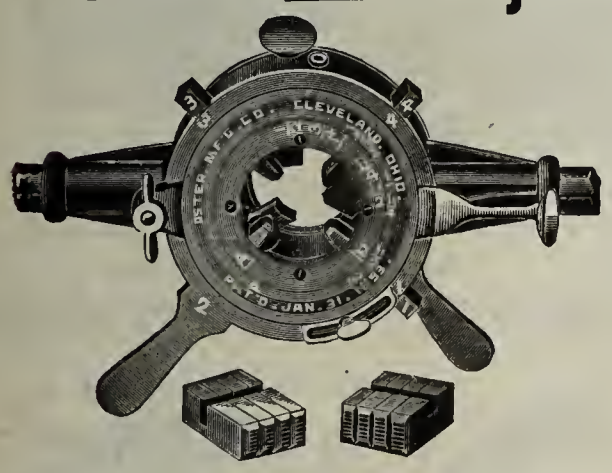
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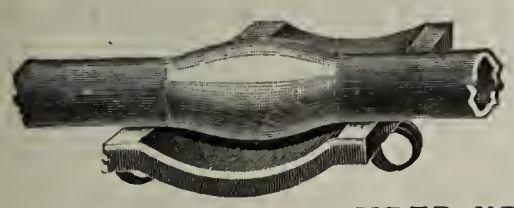
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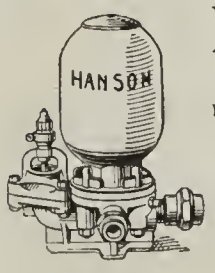
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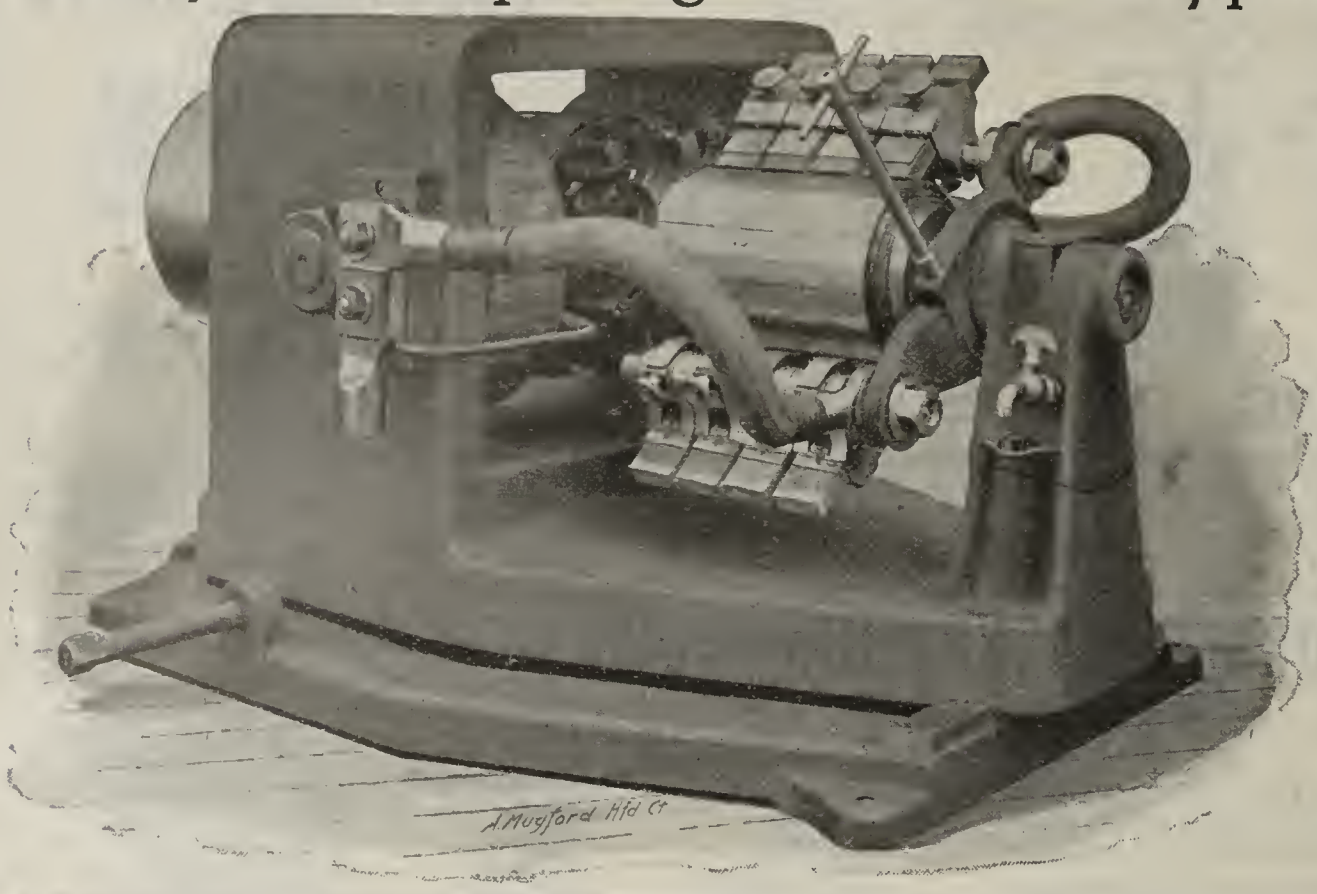
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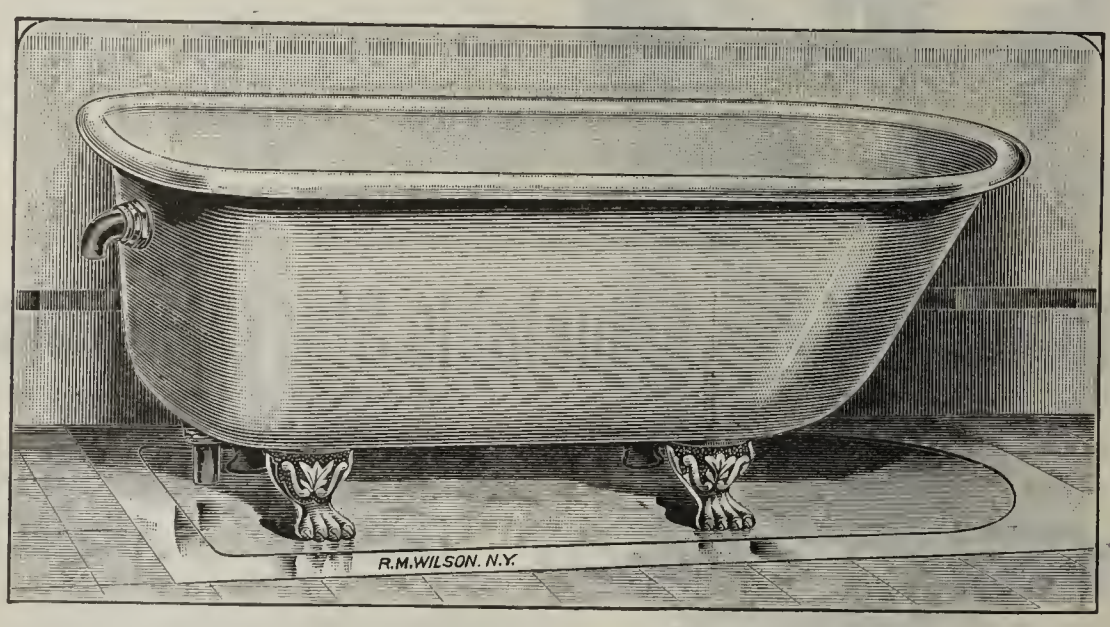
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The American Hardware Store.

By R. R. WILLIAMS, Hardware Editor of *The Iron Age*. 450 Pages. 500 Illustrations. Price, $3.00.

SUMMARY OF CONTENTS.

General Arrangement.
Office.
Shelving.
Galleries.
Elevators and Cranes.
Show Windows.
Counters.
Counter Showcases.
Upright Showcases.
Ceiling Arrangement.
Sampling Goods.
Signs in the Store.
Pillars for Displaying Goods.
Scales.
Roll Paper.
Nails.
Farm and Garden Tools.
Scythes.
Bolts, Screws, etc.
Crosscut Saws.
Hand Saws.
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Planes.
Squares.
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Axes and Hatchets.
Cutlery.
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Locks and Door Trimmings.
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Screen Wire Cloth.
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Files.
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Chains.
Belting.
Rope.
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Scale Beams.
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Pumps.
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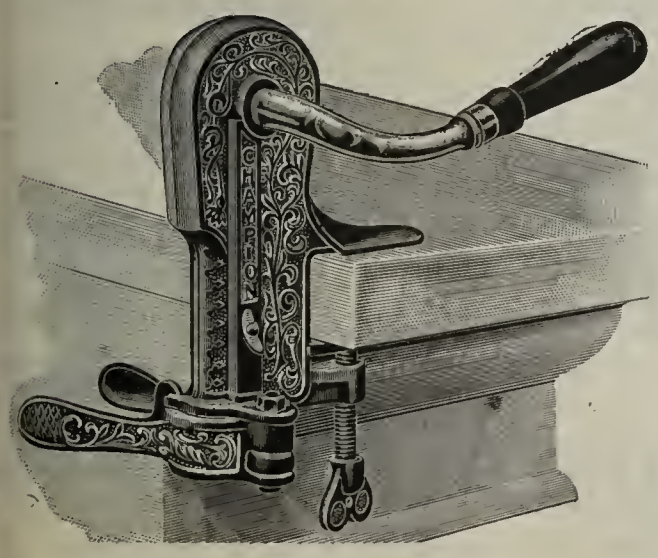
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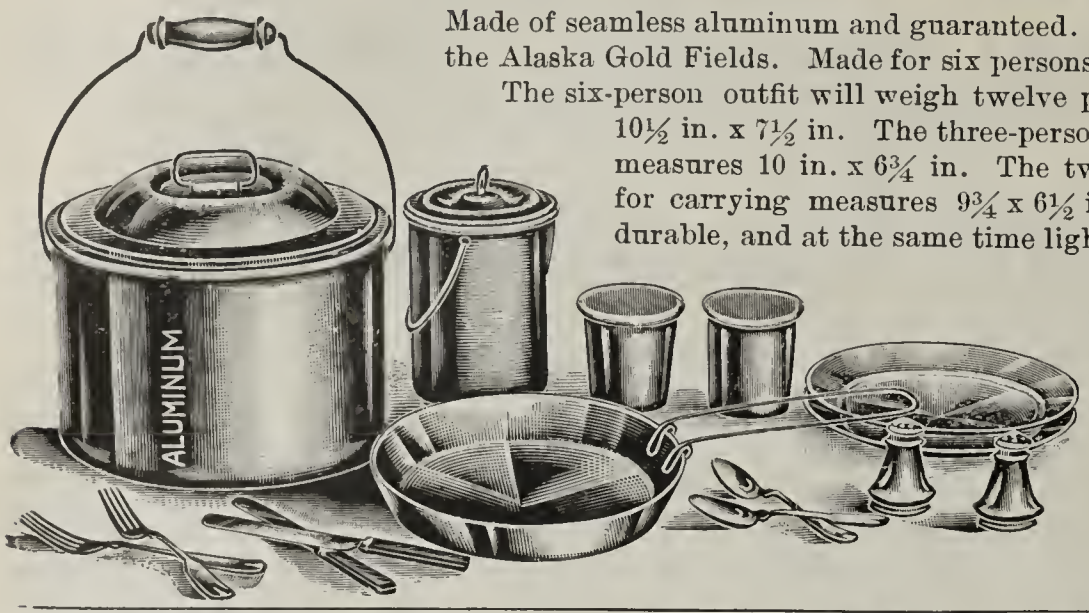
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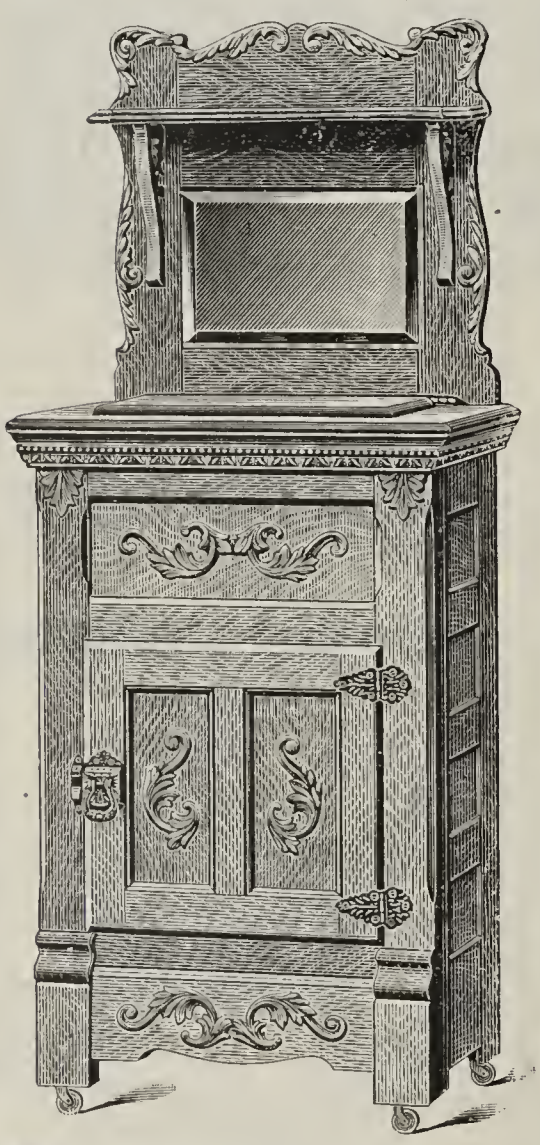
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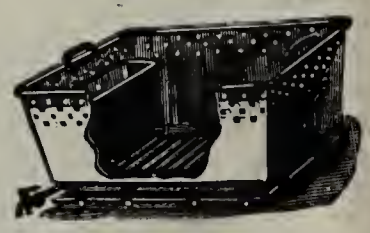
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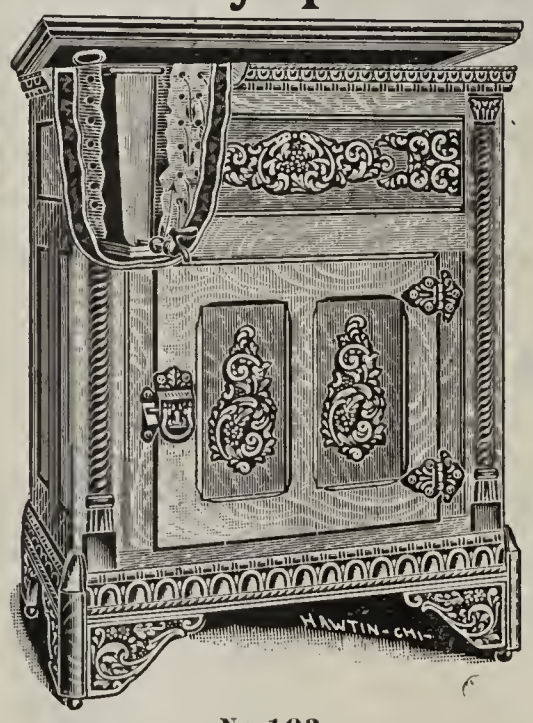
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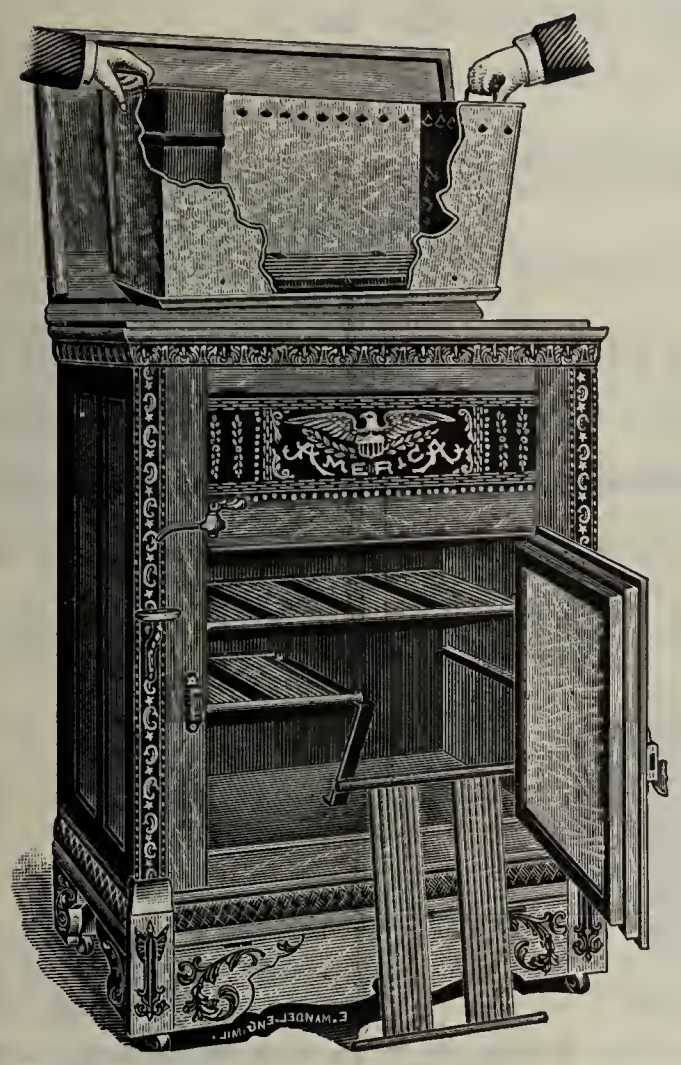
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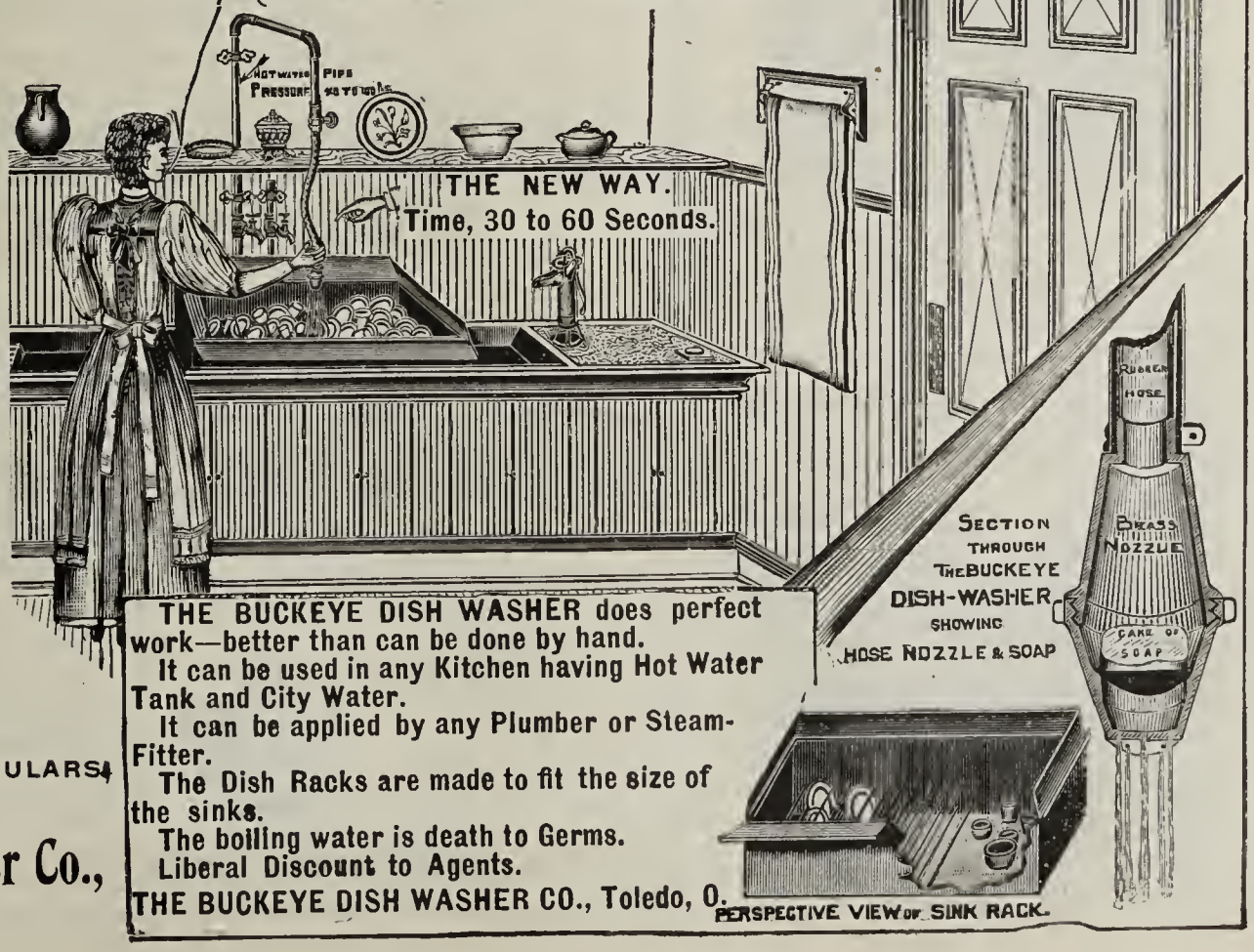
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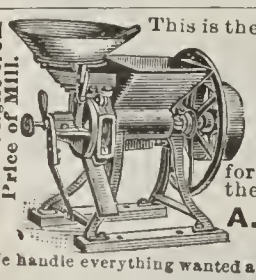
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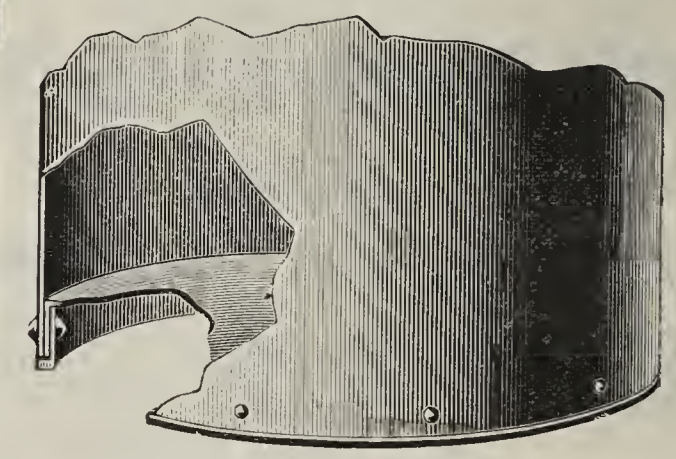
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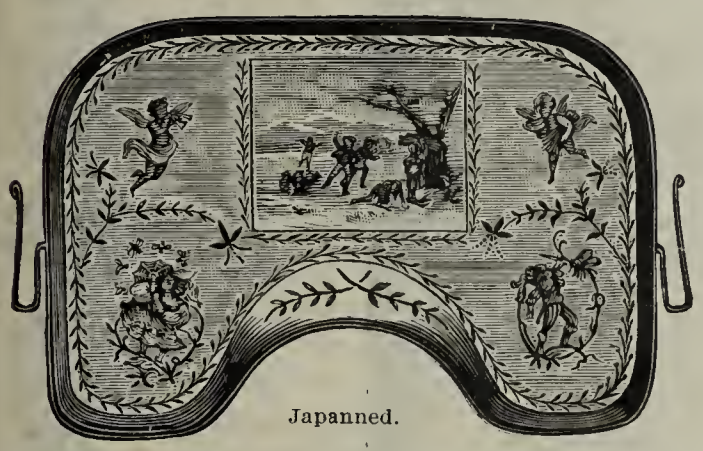
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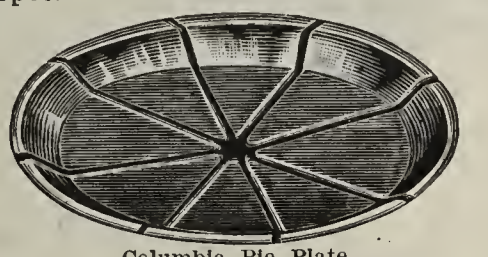
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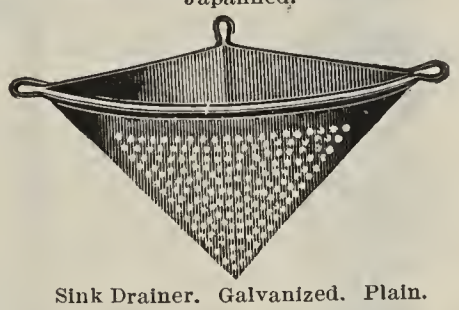
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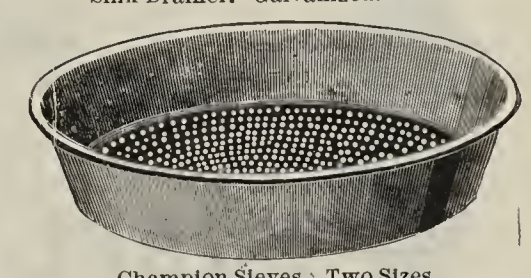
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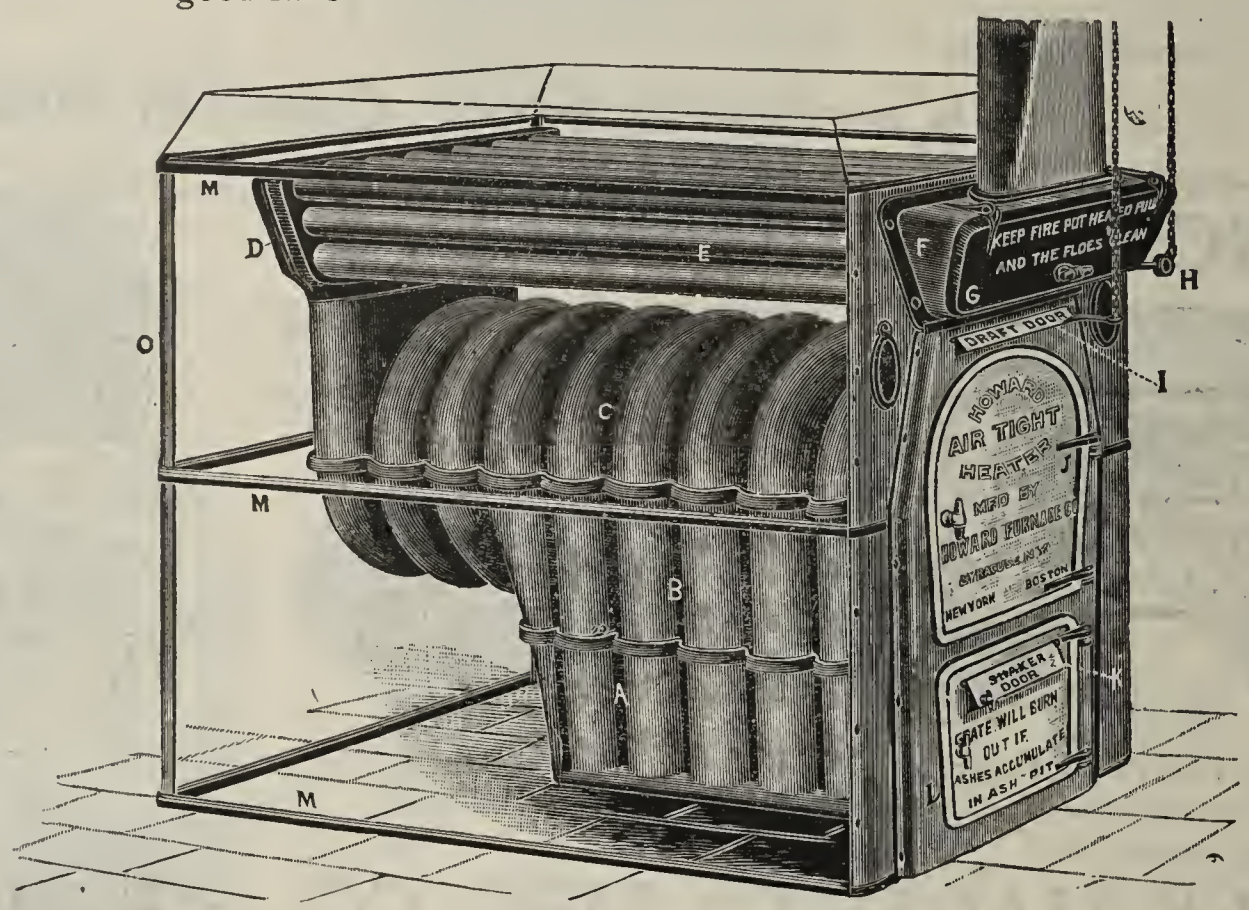
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THE METAL WORKER

NEW YORK AND CHICAGO.

Saturday, February 26, 1898.

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Index to Reading Matter.....Page 54.

The Business Situation.

The strength and stability of the existing trade situation have had a severe test during the past week. The grave apprehensions aroused in the public mind by the terrible disaster to the "Maine" and the prevalent suspicion that the explosion which destroyed the battle ship and caused the loss of so many valuable lives may have been due to treachery have had their influence upon the speculative and financial markets. But general trade has not been affected to any appreciable extent. It is true that some large enterprises are being delayed and business men are acting cautiously in the matter of new ventures, while the possibility of a warlike outcome to the present excitement is in the air. Yet the reports from trade centers continue to point to steady improvement in the volume of general business. As indicated last week, the improvement is, however, much more marked in the West than in the East. Nevertheless, even in this quarter the enlargement of business over last year, as illustrated by bank clearings, is very pronounced, showing an average gain of nearly 50 per cent. Only one previous week for years past—that ending January 8 last—had a larger volume of clearings to its credit than last week. The prices of staples have advanced or are notably firm. Wheat has risen from day to day, gaining about two and a half cents a bushel during the week without checking exports, notwithstanding that the advance was due to speculative manipulation. Corn, too, scored a fractional gain, and the recent advance in cotton has been sustained. In the iron and steel trade the volume of business is very large, but so is the production, and competiton is great. Bessemer Pig made a small advance and is very firm on heavy purchases. In metal lines, Copper is very strong and the price has started on an upward direction. A feeling of nervousness and apprehension over the Cuban situation has been growing in Wall street and was used by the "bears" to depress prices. The stock market developed notable weakness, and was only saved from demoralization by remarkably heavy purchases of American securities by London. Bonds, too, fell off in strength and activity. The money markets were firmer, with slight advances in all classes of loans due to heavy calls for funds from the interior and also to the war talk and the weakness of the stock market. The New York City banks have increased their loans $13,000,000 in the past two weeks, and their surplus reserve has meanwhile been decreased by over $9,000,000, largely on account of calls for commercial loans, a striking change from the conditions which existed in this department a few months ago.

Whatever the issue may be for the thousands of adventurous persons who are preparing to brave the hardships and toil of gold searching in Alaska this year, it is certain that the "Klondike craze" has given an immense impetus to trade in various directions. On the Pacific Coast the business in miners' supplies and outfits and that of the transportation companies is already reported to be enormous. In British Columbia the business activity directly connected with the Klondike movement is said to be unprecedented. Here in the East, and presumably all over the country, evidences of keen interest in the new Eldorado are seen on all sides. "Klondike supplies" is becoming a familiar advertisement, and the newspapers daily contain accounts of parties starting or preparing to start for Alaska in the search for gold. Old miners say that not one out of a hundred of the prospectors is likely to reap any adequate reward, and probably not one out of a thousand will make a fortune. But that is no deterrent to the would be Klondikers. They are going to the gold fields in swarms, and are spending good money on outfits and transportation, which money is going into circulation and helps to swell the volume of trade.

Action of Mercury on Aluminum.

According to *La Révue Technique* of Paris, M. C. Margat, an instructor at the University of Geneva, Switzerland, has made a curious discovery concerning the action of mercury on aluminum. If the surface of a plate of aluminum, which has been well sandpapered, is rubbed lightly with amalgam of mercury, there will be produced on it, within a very short time, an extraordinary efflorescence. The surface of the metal will soon be covered with a growth of alumina, which will shoot up literally within plain vision. No more remarkable sight is to be observed than the formation of this miniature forest, which attains, in the course of half an hour, a hight of nearly ½ inch. If the metal is brushed over it will be found pitted, as if with an acid, at all the parts in which this rapid oxidation has taken place. But a little heat applied to the plate suffices, by reason of the volatilization of the mercury, to arrest the phenomenon entirely. It will, however, be reproduced each time the surface is rubbed anew with a little amalgam of mercury. The experiment succeeds more easily with the amalgam, as it is difficult to sufficiently pulverize a drop of mercury with the finger, the metal not soaking into the aluminum. It is probable that the mercury merely produces catalytic action, and that it then allows the aluminum disintegrated by its presence, or, perhaps, reduced to a porous condition, to be more readily attacked when cold by the oxygen of the air. Nevertheless. the plate is heated to a degree appreciable to the touch, and actual combustion is evidently established.

The success which has attended the Southern cotton mills has induced a movement for the establishment of woolen mills in the Southwest. It is believed that the woolen industry can be conducted with equal success in that section and the matter is receiving enthusiastic support in the South.

THE LETTER BOX.

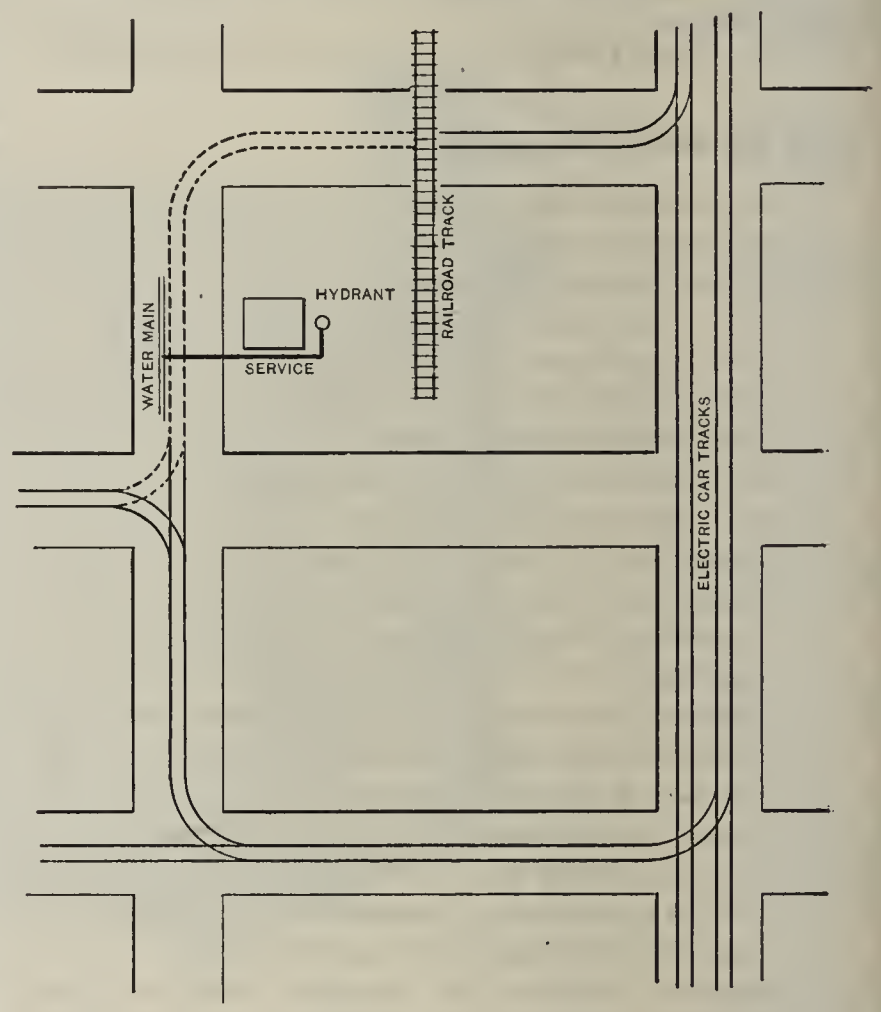
Hoods for Ranges.

From S. & S., Warren, Pa.—Will you kindly give through the columns of *The Metal Worker* information concerning ventilating hoods over kitchen ranges? We desire to know the proper size and shape of a hood and the sizes for the pipes leading from it. If any of these hoods have been illustrated in *The Metal Worker*, we should be glad to know in what number they appeared.

Answer.—We have published in back numbers of *The Metal Worker* several contributions on this subject, and would particularly refer our correspondents to an article entitled "Pattern for a Range Canopy," printed in the issue of December 7, 1895. On talking with a prominent manufacturer of ranges for hotel and restaurant kitchens and for household use, we find that there is no definite rule for determining the size of hoods, the location of the range and the hight of the ceiling in the kitchen being the conditions which govern. Where the wall space is clear and the ceiling of sufficient hight the hood should extend beyond the range 6 inches at each end and should extend out beyond the front 6 inches. The bottom of the hood should be about 6 feet 2 inches from the floor. For a range of family size, where the hood would be 3 x 4½ feet in dimensions, it should not be over 18 or 20 inches high. If the dimensions of the hood were 4 x 10½ feet, in order to get a graceful curve to the hood and a good appearance the hood should be from 28 to 30 inches in hight. It is very seldom that a hood is made 36 inches high from the bottom line to the top. This is only when the hood is very large and the ceiling is of such a hight as to permit it. The size of the pipe used with the hood is governed entirely by the size of the flue to which it is connected. In many instances the outlet from the hood is put into the same flue which is used in connection with the fire box of the range, and if the opening was too large the operation of the range would be interfered with. It is better to put a register over the opening in such cases so that the ventilating opening can be entirely closed if it interferes with the work of the range, and particularly when the oven is used. In cases where a separate flue is provided for ventilation, immediately beside the flue used for the range, the size of this flue will determine the size of the pipe that should be used. If a pipe is to be carried from the hood through the roof of the building the size can be made as large as circumstances will permit. In such instances where very long hoods are used it is not uncommon to take two pipes, one from near each end of the hood, and connect them by means of a Y into a larger pipe of sufficient capacity and which is carried out of doors. In hotel or restaurant kitchens the main pipe is sometimes as large as 16 or 18 inches in diameter, but 10 or 12 inches is more common, and if a single pipe 6, 7, 8 and 9 inches are common sizes. The shape preferred is a curve from the wall line at the top to outer edges at the bottom, although for ecocomy the straight pitch is often used.

Corroded Lead Pipe.

From N. H., Homestead, Pa.—We send you a piece of lead pipe which is a section of a line that has given us a great deal of trouble from corrosion. We also send you a sample of the clay in which the pipe was laid, and will be very glad if you can tell us what caused the corrosion. As this is sometimes due to electrical action, we inclose a sketch of car lines from which you will see that the service pipe crosses the trolley line, but the dotted portion indicates that the cars do not run continually over the track, as they are not permitted to cross the railroad, though the wire crosses, the result being that the cars run very infrequently over that portion. We were told by the engineer of the electric line that in order to affect the lead pipe it would have to come in contact with a direct current. We have had the clay tested for acid and found that it did not contain any injurious substances. We would like very much to find out if the trouble is caused by electrolysis. When we put in the service line we bored about 10 feet in the street, and the pipe, when dug up, was as badly eaten as that portion which was laid in the trench. It is a very common thing in Pittsburgh to find lead pipe which has been laid in cinders badly eaten. These cinders come from glass factories and contain an



Corroded Lead Pipe.

acid which corrodes lead. In this case, however, the pipe was in the clay.

Answer.—The corrosion of lead pipe by the action of clay and other natural soils is not probable and not known in the experience of engineers of city water works. The electrolysis of water pipes by their crossing or running in nearby parallel lines with electric railways is well known, and has been brought to the notice of trolley line companies in a legal way, to compel repairs of pipes and changes in the electric circuit in a manner to avoid the electrical corrosion of water and gas pipes. An electrolysis clause has also been inserted in charters to electric railways. The dead end of the trolley line as shown in the sketch is charged at all times from the main line of travel, which we apprehend turns in the opposite direction at the street crossing near the pipe affected. The crossing under the railway tracks of the house service pipe has probably made a short circuit by the water main back to the power house. The lead service pipe being nearest to the tracks would naturally become the most direct path for the current through the moist earth. The trouble is very much increased by defective rail bonding. There is much that should be known that is not contained in our correspondent's complaint. That is, if other service

pipes in the neighborhood are giving out, whether the water main from this point is a short circuit to the power house, as also the condition of the rail bonds. This trouble occurred in the city of Albany, N. Y., and was remedied by laying a line of heavy copper wire in the ground directly from the negative buss-bar in the power house to the neighborhood of the trouble, and connecting at several places directly to the water in the mains by bronze plugs screwed into the main and connected to the main wire. In the newer laid Brooklyn tracks a supplementary return of large galvanized iron wire is laid in the ground between the rails and connections made with the rail bonds, terminating in an overhead return to the negative buss-bar.

Injustice to Plumbers from No Examining Board.

From S. R., New York.—Can *The Metal Worker* tell me why the Examining Board of Plumbers for the Borough of Manhattan is not appointed and why their appointment is not in sight? I ask the question as a prospective applicant, and the delay in the appointment of the board causes what perhaps is a good opening to slip away and certainly keeps me from taking paying work. Can you advise any remedy?

Answer.—There is an evident injustice to the citizens who desire to take the examination in order to secure certificates and take out liceases when the city does not provide a Board of Examiners. To that class of citizens who are identified with the plumbing business there is no more important department in the city government than the Board of Examining Plumbers, and although a new charter has gone into effect that is no reason why the board should not have been appointed ere this, especially when the city officials will not pass the work of those who are not licensed plumbers. Our correspondent might engage in work and when stopped appeal to the courts for protection. This, however, would entail a law suit. A simpler and better way is to follow the custom employed by out of town plumbers who occasionally have a plumbing contract in New York City, and that is to get some other master plumber who has a license to take out the necessary permits for the work and to have the work done in his name. His application for examination will be received and placed on file.

Testing Gas Pipes.

From E. E. H., St. Louis, Mo.—Will *The Metal Worker* please explain how many ways there are for testing gas pipe and the advantages of each?

Answer.—The advantages of different systems depend upon the conditions under which they are to be used, and must be judged by the workman. To answer the first part of the question we have reproduced below, from "Practical Gas Fitting," a work which can be supplied by our Book Department, the following: If the application of the test pump reveals the unpleasant fact that the job is not tight, it will be necessary for the fitter to hustle to find the leaks Should the rapidity with which the gauge falls after being pumped up demonstrate that the leak is a large one, but little time or trouble is likely to be required in finding and remedying the defect. First go over all the caps and see that none of them is loose, and that no nipple or drop has been left out. All the time the job is being gone over keep the ears open and have the pump steadily worked, as the sound given off by the escaping air will frequently locate the trouble. For this reason it is well to test during the dinner hour, or before or after working hours, when comparative quiet will reign in the building. If all caps and nipples are found properly secured, then look for splits in the pipes, the usual place for such defects being where the tongs have gripped the pipe in screwing up. If the gauge falls very slowly, demonstrating the leak to be a small one, there will be much more trouble in finding it.

One method of locating the leak is to mix a quantity of strong soap suds, and with a clean brush generously apply the mixture over the surface of the different pipes, at the same time watching carefully for the bubble that will be blown from even a very small leak by the escaping air. It will, of course, be understood that during all these operations the pump must be kept steadily working. Another method is to pour into a cup on the pump provided for the purpose a quantity of ether, in this case the nose being the organ used in the hunt, the fitter carefully going over the pipes, smelling for the ether that will escape from the leak. This method of finding a leak in an open building is somewhat uncertain and tedious, but is frequently used with success.

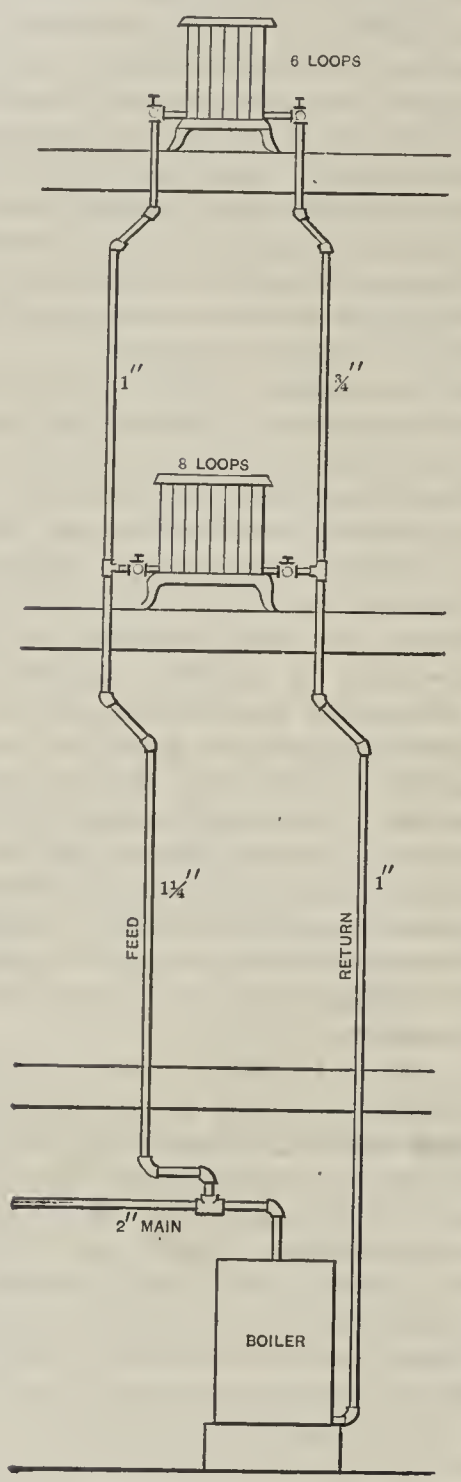
If the gas service is in and permission from the gas company be had, the service and house main can be connected and the nose may be assisted by a lighted taper in the search. If the lighted taper is employed great care must be exercised to guard against setting the building on fire, as the very small flame likely to result from a leak may not be perceptible to the eye, especially in the daylight. Or the flame may be at the back of a fitting in some inaccessible place, beyond the reach of eye sight. It is a good rule to test with a light in no place that cannot be easily reached to blow out any flame that may result, and further, when there is a strong odor of gas, a light must never be put in confined places, such as between floors or behind partitions—this especially applies to searches for leaks in finished buildings—for by so doing the fitter may have an explosion added to his troubles.

Sometimes it is possible to fill the pipes with water and locate the leak in that way. This is a risky business, however, as it is very difficult to empty out the water, especially from the smaller pipes, and may cause trouble for months. The writer, nevertheless, has known fitters who did not hesitate a moment in adopting this plan, it being a certain and rapid plan of finding leaks. When following this plan, however, the proper way to empty the pipes is to take off the caps on the nipples and drops that are highest. Then remove the caps on the lowest nipples and drops and on the main, blowing violently several times into each nipple on the upper or top flat. Then take the caps off the next lower flat and blow into all the pipes on that floor, and so on down, keeping at it until there is no uncertainty as to the pipes being entirely emptied of water. They can then be left for a few days and the blowing out process repeated. This method of finding leaks is, of course, out of the question in cold weather.

In fitting up large buildings it is a safe plan to test the work in sections, say a flat or two at a time, leaving suitable connections for joining all the parts tested before making the final test of the whole job. Having found the leak, there comes up for consideration the question of making effectual repairs. A split pipe or fitting must be removed and replaced with sound material, but a small hole in a fitting may be closed with gas fitters' cement, the fitting being first well heated by means of the blow pipe and lamp and the cement applied to the attachment while hot. An escape at the screw head may also be firmly closed with cement or with red lead well rubbed in.

In another part of the book this is the advice given for testing the piping: The last and most interesting part of a gas fitting job is testing the pipe. The test should be just as rigid whether an inspector's certificate is required or not. There are two kinds of test pumps—spring gauge and mercury gauge. The reader can see a cut of them by turning to any catalogue of gas fitters' tools. The mercury gauge is the more suitable, because it is more sensitive than the other. The glass may be placed nearly at the bottom of the cup, in order to use as little mercury as will give the required pressure; then should an accident occur there will not be much lost. A column of mercury 2 inches high is equal to 1 pound pressure. Eight inches is ample hight for the mercury column when testing illuminating gas pipe, as there is at most only a few ounces pressure on the mains at any time. The pump for testing may be placed at any convenient opening, and after allowing a moment for the

mercury to settle it should stand 15 minutes without even getting flat on the top of the column. Very small houses may be passed with a ten minutes' test, as the leaks will show sooner. If the mercury falls gradually the leaks are either considerable or very near the pump. If it stands for several minutes and then drops suddenly the leak is very small and usually very remote from the pump. If the pump proves that the pipes leak the pressure may be let off and a little sulphuric ether poured into the opening for the purpose, or into the barrel of the pump. Then pump up the pressure again. A large leak may be smelled and heard too, as soon as you get near it, but the nose will have to be placed close to a small leak to detect the smell of ether. A little soapy water can be used to advantage in hunting gas leaks. If the suspected place is painted with it the air will make a bubble, showing exactly where the leak is. Split pipe and fittings should in all cases be removed. If the fitter has any time to spare when the job is finished, he can employ himself by loosening the caps while the pressure is on to see that no pipe is clogged.

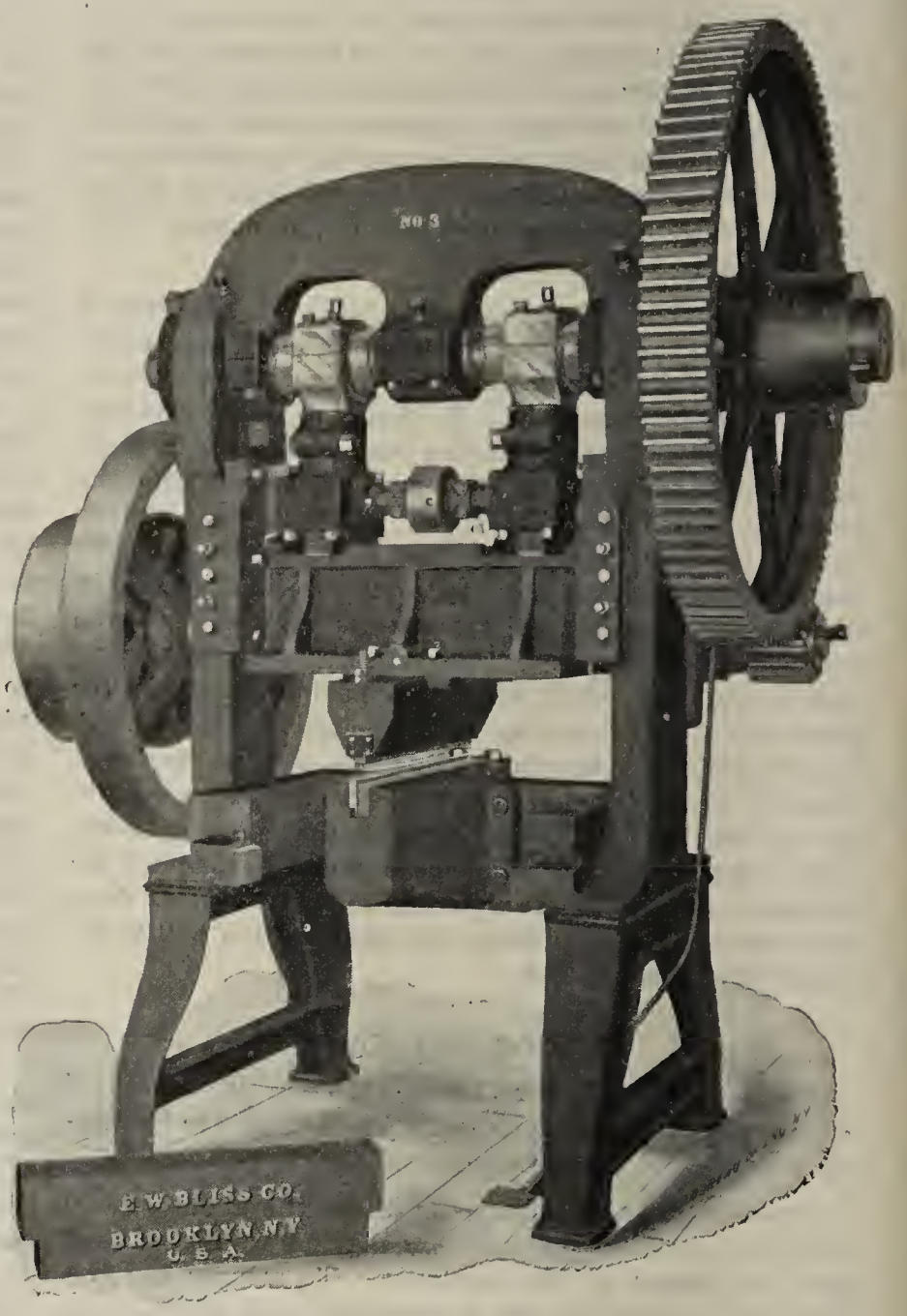


What Makes the Radiator Noisy?

What Makes the Radiator Noisy?

From J. R. M., Philadelphia.—I submit herewith a sketch of a steam heating job that I have done and which, being my first, I would like a little information on in regard to the radiator on the second story, which is connected with the pipes by means of a close nipple and a globe valve. The main is then reduced and run up to the third story and connected with an angle valve. If the third-story valves are kept closed the job works all right, but as soon as we open the third-story valves there is a continual rumbling noise as though of boiling water. These two radiators are on the south side of the building and are the first connections from the boiler. The second conections from the boiler are taken from a main which crosses the cellar and rises in the same way, and connects with two radiators in the same way. When the two valves are opened in the latter case there is no noise as in the first radiator. I should be glad to learn the cause of the trouble and how to remedy it through the Letter Box.

Note.—No doubt some of our readers will give assistance in this case, as the appeal seems to be to them. In the meantime we would say that there seems to be nothing that is wrong with the pipes as connected, and that many jobs are connected in the same way and give no trouble. It is quite possible that the hammering is due to water which fails to return to the boiler owing to the air valves not working as they should. If he will examine his air valves to see if they are in a condition to permit the air to pass off when steam is turned on, or to admit air when it is shut off, he may find that something is wrong which can be easily remedied.



The Bliss Double Crank Geared Press.

The Bliss Double Crank Press.

The special double crank press built by the E. W. Bliss Company, 16 Adams street, Brooklyn, is so designed that it may be used for nearly all the operations required in the manufacture of sheet iron and steel goods, such as vapor stoves and ovens, coal hods, drip pans, elevator buckets, &c., also for operating gangs of punches for rivet holes in tanks, &c. The cross head is guided in long adjustable bearings so that cutting and perforating dies, as well as others requiring great accuracy of movement, may be safely operated. It is built either geared or with a fly wheel, as will be seen from the illustrations. It is also built in an inclined position if so desired.

The geared press has its bed with a removable front piece which is taken out when the machine is to be used for wiring dies. The front piece is left in place when cutting, piercing, stamping or combination dies are to be used. In this manner the machine may be em-

ployed for nearly all the die operations in the manufacture of heavy pieced iron ware.

The fly wheel press, with open front and sunken bolster, is specially adapted for the manufacture of tin ovens, such as are made in connection with gas and vapor stoves ; it is also adapted for bread boxes and similar work. The special horns and forms shown are intended for setting down the inside corner seams of oven bodies. The principal dimensions of this press are as follows : Opening in bed, 16 x 28 inches ; width between uprights, 36 inches ; standard stroke of slide, 2 inches ; maximum stroke of slide, 4 inches ; area of die bed, 24 x 35 inches ; weight, geared press, 9000 pounds ; fly wheel press, 8000 pounds.

Recent experiments at the McGill University, Montreal, Canada, are reported to have demonstrated that a substance so hard and brittle as marble may, under certain conditions, be molded like clay. According to the published descriptions of the experiments a miniature column of pure Carrara marble was placed in a sheath of iron and submitted to gradual and long continued pressure, with the result that the marble shortened and thickened, bulging so as to swell the iron sheath. The iron then being cut away the marble column was found to be greatly altered in shape, although still remaining solid and brittle as before. No increase of temperature or other agency than the pressure was applied in producing this result.

George G. McMurtry, president of the Apollo Iron & Steel Company of Pittsburgh, has returned from a trip to Europe. He reports having had a very pleasant time and is much improved in health.

The almost forgotten project for a Grant memorial in the shape of an ornamental bridge over the Potomac has been recently revived at Washington. The preliminary survey for the bridge has just been completed and the matter is attracting some attention. A proposition has been put forth to make the structure strictly a memorial by having a Grant tower at one end and a Lincoln tower at the other. Such a bridge is estimated to cost about $1,500,000.



The Bliss Double Crank Fly Wheel Press.

Coating Metals with Tin.

The following receipts for coating metals is taken from *Zeitung für Blechindustrie :*

A mixture of 20 parts powdered cream of tartar, 10 parts of stannic chloride (perchloride of tin) and 50 parts of water is heated at about 60 degrees C. (140 degrees F.) until dissolved. Any zinc articles dipped in this liquid will quickly be covered with a gray deposit, and should then be removed and rubbed or brushed, without rinsing, until, in a few minutes, the surface becomes perfectly white and lustrous. The same effect may be produced if, instead of dipping the zinc, the solution is mixed to a thin gruel, with clean sand, and rubbed over the surface. For copper, brass, iron and lead the same solution is suitable, but as zinc contact is essential a little zinc powder is added to the mixture. Brass, bronze and copper may also be tinned by dipping the articles in a bath of 16 parts ammonium alum, 1 part of tin salt (stannous chloride) and 300 parts water at boiling temperature. When the bath is exhasted it may be renewed by adding more tin salt, but not in excess of the foregoing proportion—viz., one part. To tin iron the cleaned metal is dipped in a bath of 2¼ gallons of water to 1 ounce of powdered cream of tartar and ⅔ ounce of tin salt, but must be in contact with zinc or the tin will not be deposited.

John A. Meade & Co. of New York have been awarded the contract for equipping the proposed New York garbage plant which will be erected at 131st street and East River with conveying machinery. The contracts amount to about $7500. It is expected that bids will be called for for the equipment of another similar plant by the New York authorities within the next week.

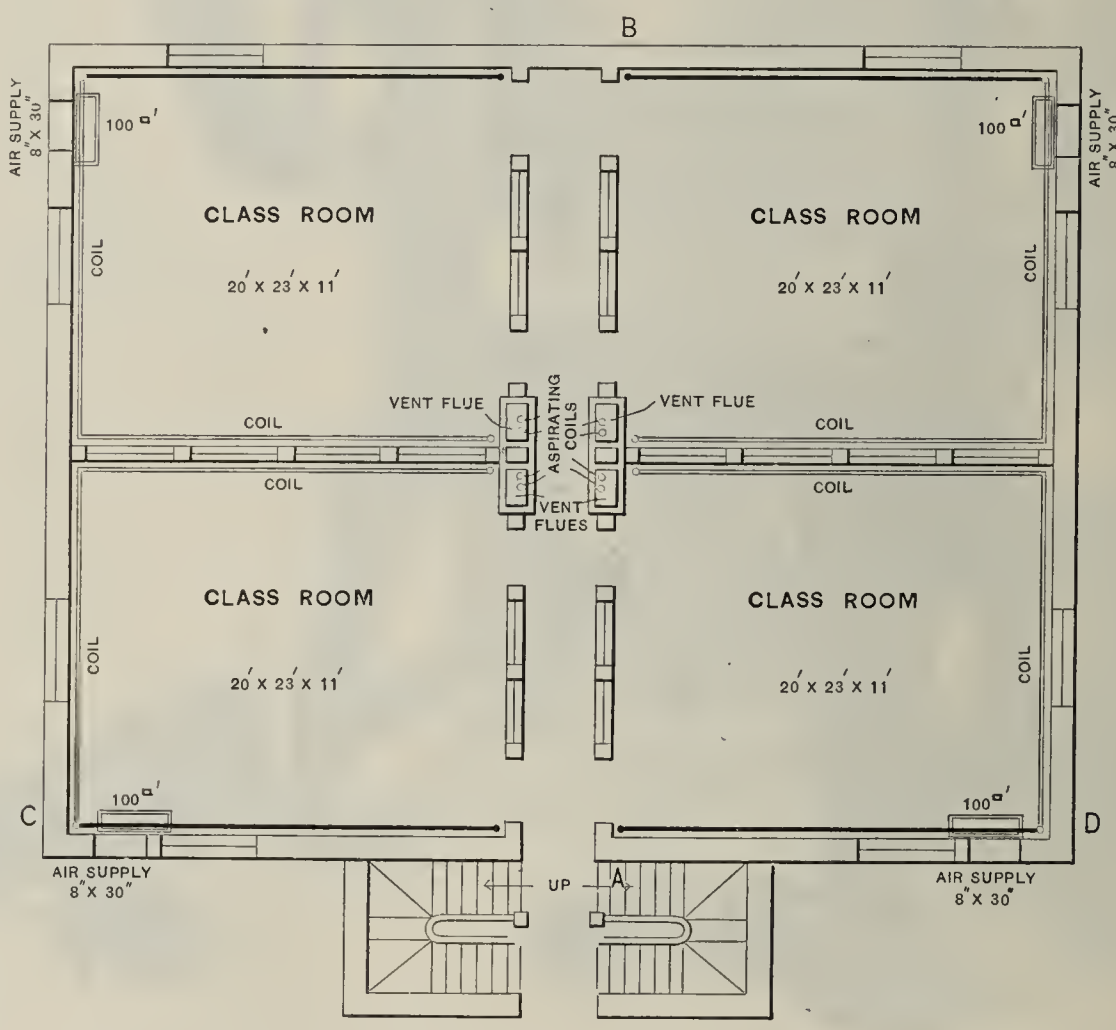
HEATING AND PLUMBING.

HEATING THE CARMEN STREET SCHOOL.

The necessity of providing a better method of heating and also furnishing some means of ventilating the Carmen Street School at New Brunswick, N. J., was brought prominently before the Board of Education of that city on investigating the system in use. A plan of the first floor and second floor is presented in Fig. 1, showing the system as remodeled. At the time attention was given to the heating and ventilation problem the different rooms were provided with wall coils four pipes high, made of ¾-inch pipe, extending along two sides of the room. These coils presented about 50 feet of surface, while the rooms were 23 x 20 x 11 feet in size, with a capacity of 5060 cubic feet, so that the ratio of heating surface to the cubic contents was 1 square foot of surface to 101 cubic feet of space, and even with the best efficiency of a steam heating plant this is hardly adequate to the requirements of the school building.

The School Board consulted with T. B. Cryer of the firm of T. B. Cryer & Co., 28 30 Lawrence street, Newark, N. J., and a member of the American Society of Heating and Ventilating Engineers. Mr. Cryer found that the School Board had at their disposal a horizontal tubular boiler of about 12 horse-power. As economy in expenditure was important the system was improved after the method described herewith, and the success that has attended the effort is shown in the satisfactory results obtained last winter. The boiler is located in a space excavated for it, or rather blasted for it, in the rock under the school building, as shown in Fig. 2, which also shows the location of the main and return to the different wall coils and radiators, and also to the aspirating coils placed in the ventilating shafts. The pipes which are underneath the building were run in a space of 18 inches between the rock and the bottom of the floor joists, making the work of securing a correct alignment and pitch more than ordinarily difficult. Risers to supply the wall coils are taken from the ends of the heating main in the cellar, and come up in the corners of the school rooms on the outside wall near the hall in each case.

An elevation showing the arrangement of the piping is presented in Fig. 3, being on the line C D in Fig. 1. It will be noticed that the main and returns from the wall coils and the radiators run along the outside walls of the building, affording additional heating surface, and that the highest point of the heating main is at the hall side of the building, a relief pipe being carried from the point where the main rises to supply the wall coils and radiators to the main return to the boiler. Separate returns are connected with the radiators and the heating coils.



Heating the Carmen Street School —Fig. 1.—Plan of First and Second Floors.

In order to prevent short circuiting, or steam backing up the return pipe in some of the coils or radiators, a false water line is established by forming a trap in the return pipe, as shown in Fig. 4, which is an elevation on the line A B of Fig. 1. It will be noticed that the steam main in the basement is relieved at the point where it rises to connect with the radiators and coils. By the establishment of the false water line the returns from all the radiators are attached to the return main at a point below this water line, which effectually prevents steam from one return passing up another and interfering with the circulation in the coil or radiator.

Having devised a piping system the addition of the necessary radiation to provide a comfortable temperature was made in such a manner as to effect also a change of air in the school rooms. In order to prevent interference with the wall coils already in place, radiators presenting 100 square feet of surface were supported at a point above the heads of the scholars and openings prepared in the

walls for an influx of fresh air, the openings being 8 inches in hight and 30 inches in length, controlled by dampers. To secure a positive outflow of air from the room a series of flues were built, as shown in Fig. 1, making available for each tier of rooms one 12 x 20 inch ventilating flue. From this it may be readily seen that the fresh air inlet and the ventilating outlet were of equal dimensions. To secure a positive outward flow of the air in the room through these vent flues a connection was made with the steam main, and an aspirating coil was placed in each flue, extending to the ceiling of the second floor room, and presenting about 25 square feet of surface. These aspirating coils were connected with the steam main on the one-pipe system, there being no return except through the flow connection, the pipe throughout being 2 inches in size.

Without considering the surface presented by the main and return on the outer wall of the building, it will be noticed that the available radiation in each room is equivalent to 130 feet of direct radiation. The common custom is to calculate that to secure the same efficiency in direct indirect radiation 25 per cent. must be added to the amount of surface that will be required for direct radiation. Then as the direct-indirect radiators present 100 feet of surface it may be considered that only 80 feet is available as direct radiation, and this added to the 50 feet of surface present in the coils makes the 130 feet of direct radiation, and a proportion of 1 square foot of heating surface to about 40 cubic feet of space. Each room is suposed to accommodate 40 pupils, and since the system has been in operation experiments to test the efficiency by Dr. Helm of the Board of Education with an anemometer have demonstrated that about 8 cubic feet of air per pupil per minute is secured by the system now in use, and that the air in the room is changed three or more times an hour. This air supply is about one-third of what is required by law in some States, but that it is far superior to the atmosphere previous to the change is said to be clearly shown by the comfort of the pupils and their increased interest and improved standing in their studies.

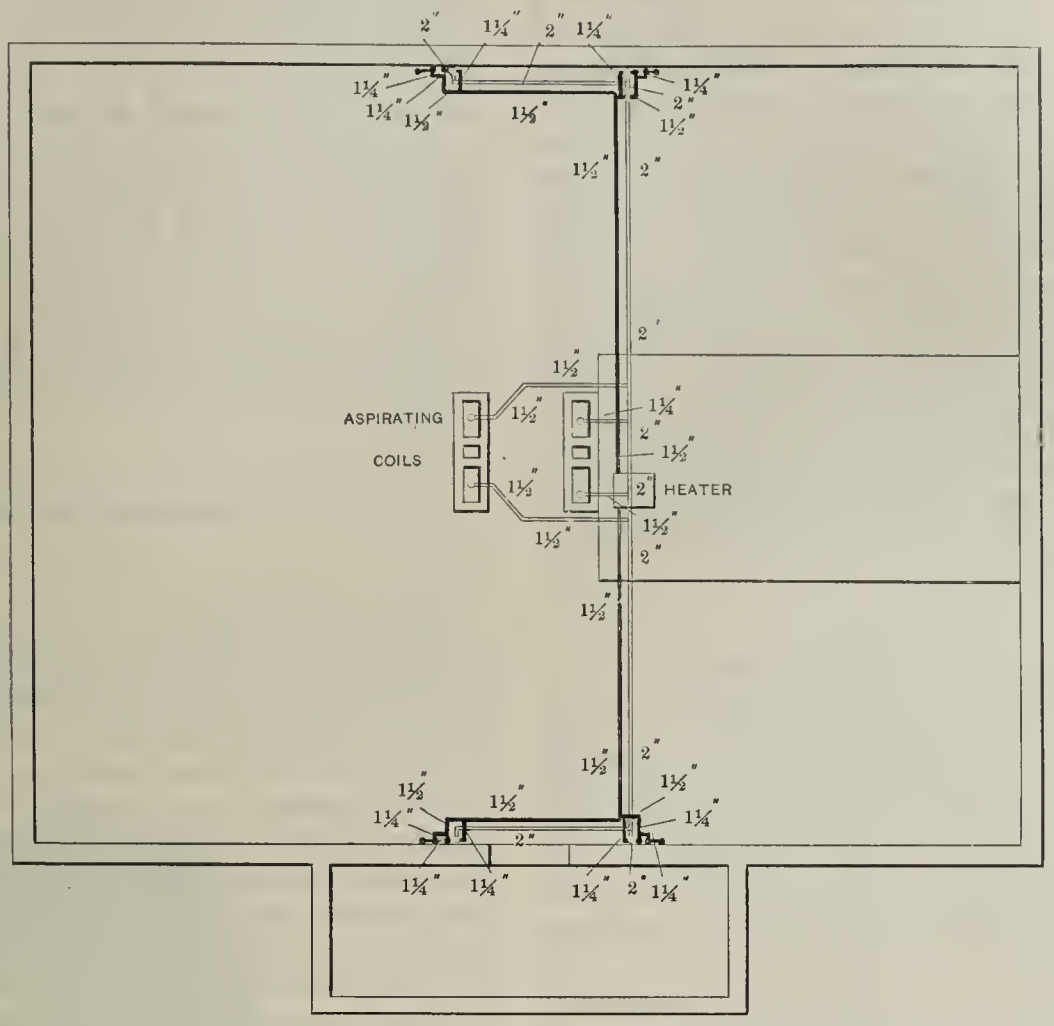


Fig 2.—Showing the Boiler and Piping Under the Building.

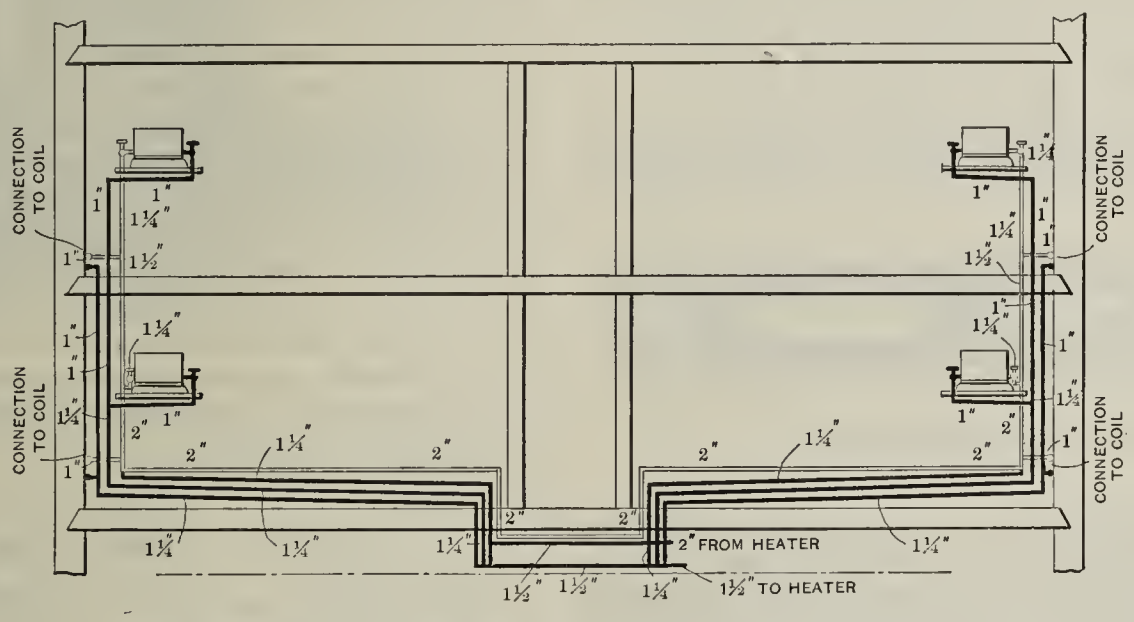


Fig. 3.—Elevation on Line C D, Fig. 1, Showing Arrangement of Piping.

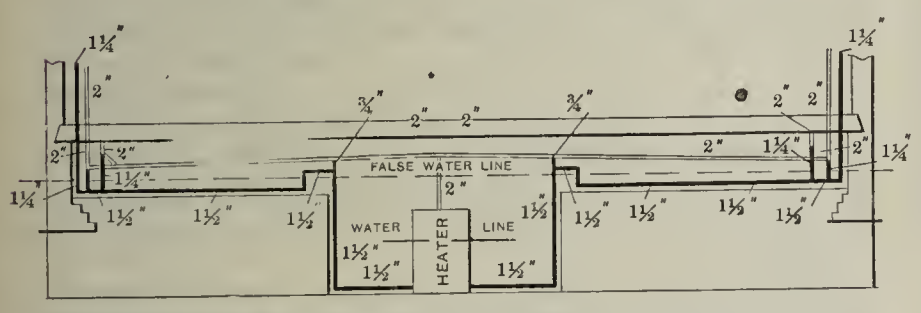


Fig. 4.—Elevation on Line A B, Fig. 1, Showing False Water Line.

RADIATOR MAKERS FAIL TO ORGANIZE.

The sharp competition, the weak market and the low prices prevailing for radiators were the occasion for a meeting of the radiator manufacturers of the United States in New York City last week. Nearly all of the larger plants were represented and the gathering included 20 prominent representatives of the trade. Three days were taken up with the deliberations of the representatives and the advantages of some combination for the improvement of the trade were discussed fully. On last Saturday, when the last meeting was held, the conclusion reached was that no arrangement which would be satisfactory to all concerned could be arrived at, and the meeting closed with no immediate probability of a similar meeting being held in the near future. The expression of some who were present at the meeting gives evidence that while the separation was marked by no acrimony it is quite possible that the competition will be no less sharp during the coming season.

Richmond Borough Master Plumbers.

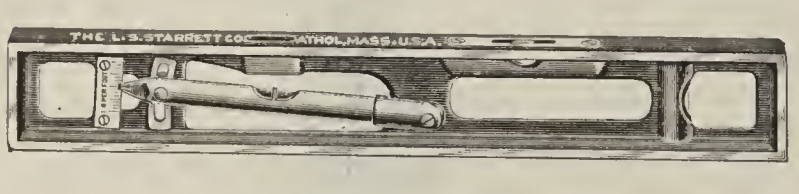
Richmond Borough, Greater New York, plumbers have been notified that they must be licensed in accordance with the rules of the Health Department, and a movement was begun recently for the organization of the men. This meeting culminated in a meeting held at the St. George Hotel February 15, when organization was effected under the title the Master Plumbers' Association of Richmond Borough.

Twenty-eight employing plumbers were present and they were addressed by W. Lockwood of New York; Thomas Kelly, president of the Brooklyn Master Plumbers' Association, and William Walsh of Manhattan Borough.

These officers were chosen: Charles W. Alexander, president; William J. Barry, secretary, and John J. Santry, treasurer.

Plumbers' and Pipe Fitters' Level.

The L. S. Starrett Company, Athol, Mass., are introducing the level herewith shown. The instrument, which is known as No. 133, includes an adjustable incline



Plumbers' and Pipe Fitters' Level.

level, a fixed level and a plumb. The hinged tube inside the working face of the frame, carrying a level glass, is adjustable to the graduated scale, and shows any incline by thirty-secondths of an inch, or less, to 2 inches to the foot without interfering in the least with the plumb or level. While it can be used as a level there is also a longitudinal groove in the seat of the frame, not shown in the engraving, that adapts it to rest on a cylindrical shaft or pipe as well as on a flat surface. From this it will be readily seen that the level is extremely useful for running steam pipes and horizontal drain pipes. The pitch being determined the hinged tube is set and then the level is used on the pipe runs and an accurate and even pitch is maintained. With the increasing use of steam heating this instrument will be a great convenience to fitters in getting their pipe properly adjusted and enable them to erect a system free from traps and giving perfect circulation, while the plumber, it is pointed out, will find it useful in running his horizontal drain pipes. The instrument is provided with either ground or plain glasses.

The Kenney Flushometer System.

We have received from the Kenney Company, 72 Trinity place, New York City, a handsome little pamphlet devoted to the Kenney Flushometer System. The first cover is adorned with a half-tone engraving of a group of prominent buildings on lower Broadway, New York, which are equipped with their system, including the Bowling Green, Standard Oil and Produce Exchange buildings. The pamphlet contains a description and an enumeration of its advantages, with engravings showing water closets, which are arranged to be flushed without the use of a tank in connection with each closet, one engraving showing a tank in an attic for flushing three closets in different parts of the building. A half-tone engraving shows a battery of closets as arranged in the Bowling Green Building, and another cut gives an elevation showing the closets on different floors being flushed from a tank in the attic. Several pages of the book are taken up with testimonials from the managers of prominent buildings, hotels and one from the Quarantine Commissioners. The last page gives a list of buildings in which this system has been used, and also of two lines of steamboats on which it is in use. A feature of the system is a valve so arranged as to flush a water closet without the use of a flushing tank, the water supply being taken direct from the service mains. The company will be glad to give full particulars to those who are interested in it.

Accidents to Boilers.

BY LISTENER.

While in the office of a manufacturer of house heating boilers recently, a customer asked the price of several sections of a vertical sectional steam boiler. The natural question was, how did the sections in the boiler become damaged so that they needed to be replaced? The explanation showed that the children in the building were playing in the basement and while the janitor was away for a short time one of them opened the draw off cock on the steam boiler and ran practically all of the water out of the boiler. The boiler was under a good fire at the time and the janitor damped the fire down by heaving on a large quantity of coal. This, however, was not done before three of the sections cracked from overheating.

This brought to light another instance where a building was heated with a hot water system, and as it was in a store building which had no tenant during the latter part of the winter the water was drawn off. The store being rented in the spring the new tenant was not familiar with the fact that the water had been drawn off from the heating system and when cold weather came in the fall a good fire was started in the boiler. A complaint was made at once to the steam fitter whose name was on the boiler that although they had a good fire they were not able to get any heat. On going to the boiler and opening the door it was seen that some of the sections were at a cherry red heat. The steam fitter knew at once that this could not be if the system was filled with water and drew the fire and allowed the boiler to cool down gradually. After the boiler was sufficiently cooled the system was filled, the fire rebuilt and no trouble was experienced in heating the building.

New York State Steam Fitters.

The following call, which specially dwells on the desirability of a full attendance at the annual convention, has been issued by President Wm. N. Tobin and Secretary Wm. F. Quinn of the Master Steam and Hot Water Fitters' Association of the State of New York:

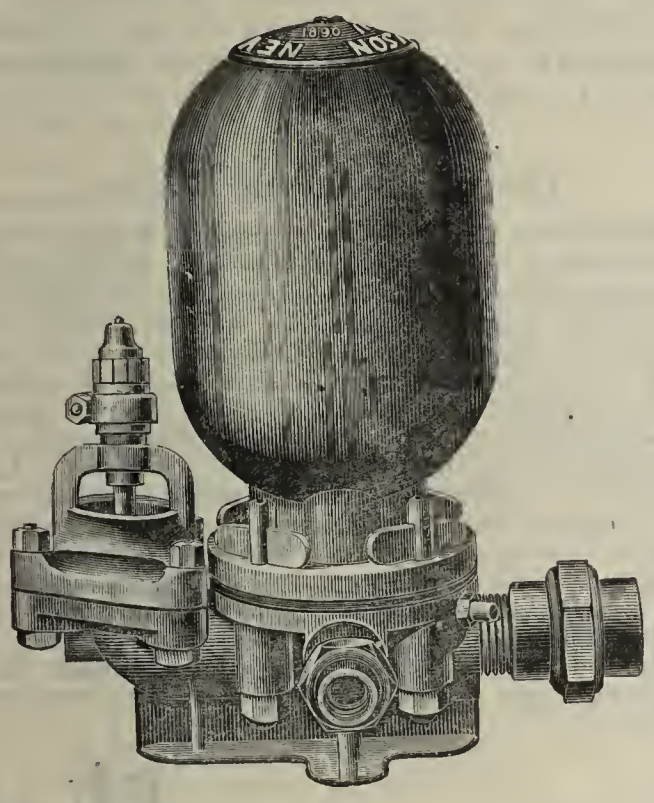
The third annual convention of the Master Steam and Hot Water Fitters' Association of the State of New York will be held in the city of Binghamton, on Monday, March 7, 1898, at 3 o'clock p.m. The master plumbers of the State convene in Binghamton on Tuesday, March 8, 1898, with headquarters at the Hotel Bennett, on Washington street, and as many of the members of the Master Steam and Hot Water Fitters' Association are also members of the Master Plumbers' Association the Hotel Bennett has also been designated as our headquarters for this meeting.

As the year promises a large increase in business, we should associate ourselves more closely to secure the desired protection against the increasing infringements on our rights as dealers. At this convention we should devise ways and means to compel this protection, and if the master steam and hot water fitters in this State that are conducting a legitimate business will arrange matters to and will attend this convention, lending their assistance and knowledge to accomplish the desired results, it will be the largest and most successful convention ever held, and we will place ourselves in a position where we can

compel the consideration due the legitimate trade. We most seriously request every master steam and hot water fitter in this State that is desirous of improving the present deplorable condition of this business to attend this convention. And if we are in earnest and determined, we will feel at adjournment that we are amply repaid for our time.

Hanson's New Patent Hydraulic Ram.

The trade will be interested in the accompanying illustration of the new patent hydraulic ram made by F. P. Hanson, 174 Centre street, New York City. The special improvement is in the delivery valve, which is located between the air chamber and the base and consists of a leather washer or disk, which is fastened on by a check nut to a central seat, the seat being surrounded by an annular opening, and a pivoted seat, through which, and between the edge of the leather disk, which conforms itself to the seat, the water is discharged with less resistance to the rising column than where other forms of valves are used. By this arrangement it is pointed out a very sensitive and quick acting valve is produced, the result being a very high percentage of water forced through to a high elevation. The delivery valve seat is made of composition brass and with an occasional new leather valve, it is claimed, will last an indefinite period. The base and air chamber are faced off true, making a perfect joint, and are fastened together with four slat bolts and keys which can be readily removed, making the delivery valve very accessible for repairs. The bolts are fitted



Hanson's New Patent Hydraulic Ram

into reamed holes and in case of breakage can be removed without trouble. They can also be lengthened or shortened to suit various thicknesses of valve packing. The plunger or waste valve is made of composition brass, very heavy and durable, and is arranged so that the stroke may be shortened or lengthened to suit a variable supply of water. Especial mention is made of an air sniff of an improved pattern which is screwed into the nipple that is between the rim and the drive pipe union for supplying the air chamber with air. The manufacturer directs particular attention to the extreme hight to which it will force water with a low head. It is further pointed out that on account of the high efficiency claimed for the Hanson ram a smaller size can be used than is ordinarily employed. The rams are made in six sizes, weighing from 31 to 212 pounds.

We have received from the Meriden Malleable Iron Company, Meriden, Conn., Supplement No. 10 to their catalogue, devoted to Plumbers' Supplies. The first ten pages relate exclusively to Brackets of various designs for lavatories and also for flush tanks. These are followed by ten pages showing a great variety of straight and offset Lavatory Legs, some plain, and some highly ornamented and adapted for the use of an apron. An extensive assortment of Soap Cups, some made for fastening to the wall with a swinging cup and others for hanging on the rim of a bathtub, are shown, those on pages 26, 27 and 28 being new. A great variety of Sponge Holders of different sizes and shapes for fastening to the wall or for suspending from the bathtubs, and some with special cups attached, are also shown, among which are several that are new on pages 36, 37 and 38. Some new things in Tooth Brush Holders, Tumbler Holders, Comb and Brush Racks are illustrated on pages 40, 41 and 42. Towel Rods, Hat and Coat Hooks, Cigar Rests and a number of specialties in bathroom supplies fill up a catalogue of 50 pages with material of interest to all who do high grade plumbing.

The Difference in Rating Tank Heaters.

BY MYSTIFIED PLUMBER.

The growing custom of supplying hot water to tenants in apartment houses is developing quite a trade for what are known as tank heaters. The size of the apartment house and the number of tenants govern the size of the reservoir and the tank heater that must be used. When the plumber has determined the size of the hot water reservoir that will be required, he must necessarily have some means of judging as to the capacity of tank heaters. There is very little information that can be used as a guide for proportioning the hot water heater to the reservoir as gathered from past experience with water backs in stoves and ranges, and the plumber naturally calls on the manufacturer to give him some idea of the capacity of the heater which he must purchase to do the work with any given job. In looking over the various catalogues of such goods, which have been furnished him on application, he finds a seeming inconsistency in rating, and I send herewith the ratings taken from several different catalogues for heaters having about the same size of grate.

The Difference in Rating Tank Heaters.

Maker.	Fire pot diameter. Inches.	Capacity in gallons.	Capacity in radiation.
A	12	50	100
B	12	75	100
C	12	75	130
D	12	75	150
E	14	75 to 100	125
F	12	100	75
G	12	120	80
H	13	175	150
I	13	250	225

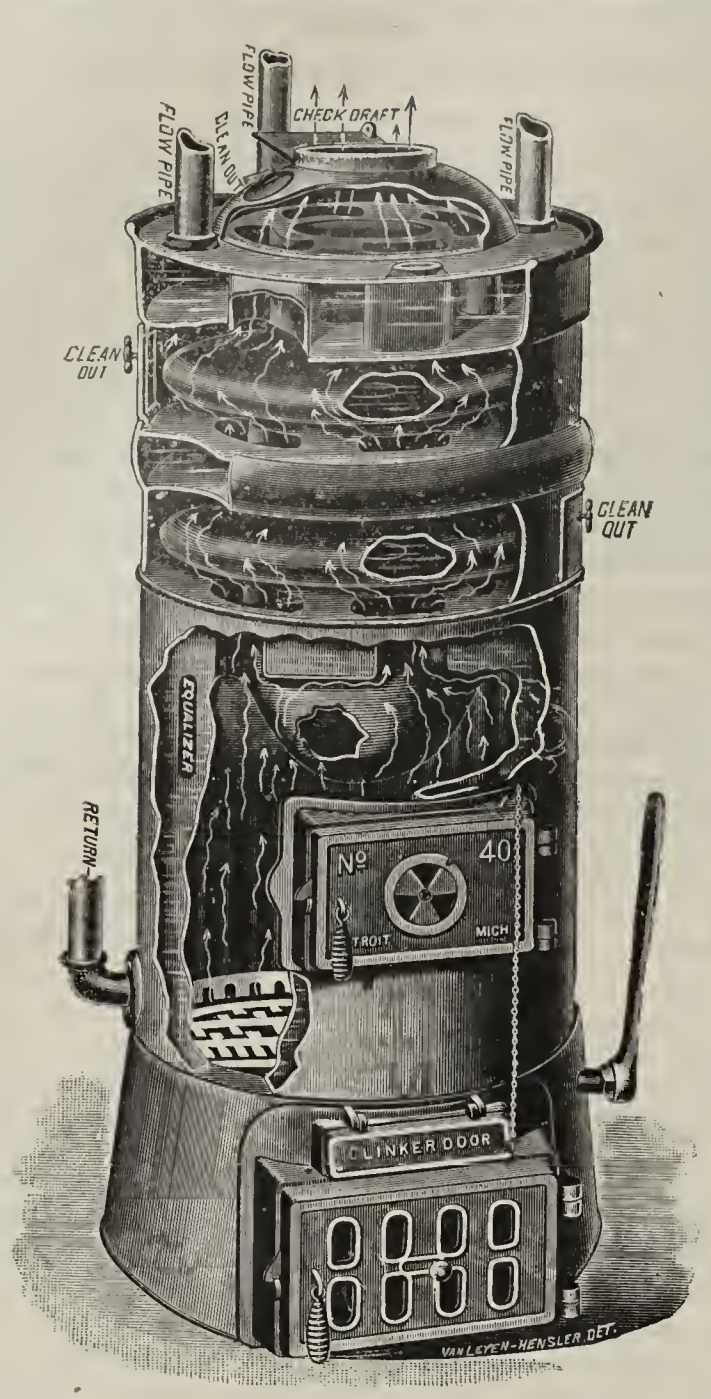
It is not strange that all the heaters are not rated of exactly the same capacity, and some difference in rating might be accounted for by the difference in construction which would provide more heating surface in one heater than another. It will be noticed, however, by a study of the two columns giving the capacity that the water heating and radiation capacity of the heaters are not in at all the same proportion in different cases, one boiler heating 50 gallons of water or 100 feet of radiation, while another of the same size of fire pot will heat 120 gallons of water or 80 feet of radiation, and it is this inconsistency that is confusing to the plumber.

There has been a general impression among those who have had experience that hot water heaters will heat from one half to two-thirds as many gallons of water as they will carry feet of direct radiation. This seems reasonable, inasmuch as in a hot water heating system the water circulates and ordinarily leaves the heater at a temperature of 180 degrees, more or less, and after making a circulation through the system is returned at a temperature of about 150 degrees or less, losing 30 or more degrees in temperature in the radiators and piping system. It is also generally known that radiators hold on an average considerably less than a quart of water per square foot of surface, and some are said to hold but one pint of water. Taking this into consideration and also that the water returns to the heater to be reheated at a temperature of 150 degrees, it seems reasonable that a given heater could not heat as many gallons of water as it will carry square feet of radiation. The ratings given in the above table, however, in the majority of instances state that the tank heaters will raise from 40 or 50 degrees, the temperature of the water from the street main, to a temperature of 212 degrees as many gallons of water per hour as given in the table. From a study of the table it is natural to conclude that some of the heaters must be overrated in their water heating capacity or underrated in their capacity to carry radiation.

Among recently authorized corporations in Illinois are the Acetylene Generator Mfg. Company; capital stock, $50,000; incorporators, H. W. Carter, A. H. Graves and Charles W. Beck.

The Peerless Heating Boiler.

We show in the accompanying illustration a broken view of a Peerless boiler made by the Detroit Furnace & Heating Company, Detroit, Mich., who are seeking to en-



The Peerless Heating Boiler.

large their boiler business for 1898 by placing on the market a new line of steam and hot water heaters. They have also completed their line by adding additional sizes up to and including 30-inch grates. The latter they state is as large as they expect to make their round boilers, depending for boilers of additional capacity on a vertical sectional square boiler, which they expect to have ready for the market by April. Although comparatively new in the boiler field the manufacturers report a very satisfactory demand for their product, particularly among jobbers and other manufacturers who wish to add that type of boilers to their line. As will be seen by an examination of the cut, the travel of the products of combustion in this boiler is back and forth, around and through the sections, the flue spaces being so arranged that the hot gases impinge directly upon the water surface above, giving, it is claimed, the greatest efficiency. The manufacturers will be glad to furnish particulars of these boilers to any who are interested.

Michigan State Plumbers.

The annual convention of the Michigan State Association of Master Plumbers was held at Lansing February 16, with a large attendance. After disposing of the regular business the following officers were elected:

President, James Meathe, Detroit.

Vice-President, F. C. Bennett, Lansing.

Treasurer, John F. Wheeler, Kalamazoo.

Secretary, S. K. Morgan, Detroit.

Executive Committee: James W. Partlan, J. H. Crumley of Detroit and W. W. Armstrong of Lansing.

Delegates to the National Convention: C. G. Jewett of Howell and W. H. Sullivan of Bay City.

Alternates: Titus W. Hutzill of Ann Arbor and M. N. Eddy of Alpena.

Delegates to the Central League: W. T. McGarrin of Grand Rapids and J. H. Crumley of Detroit.

Ohio State Plumbers.

The convention of the Ohio State Association of Master Plumbers was held in the Knights of Pythias Hall, on East Third street, Dayton, Ohio, February 18. The convention was opened by Secretary Louis Poplowsky of Cleveland, Ohio, on account of the illness of both President Walker of Toledo and of Vice-President C. H. Ware. Among those present were J. S. Farrell, president of the Indianapolis Association, and W. T. McGarren, president of the Michigan State Association. Among others present were B. Robinson, Plumbing Inspector of Cleveland; Tobias Ruhwedel, Plumbing Inspector of Columbus; J. A. Smith, Akron; George Stoker, William Boely, Charles Howman, James McGrath, Arthur McFee, C. Schlemmer, James Dowd, Tom Canary, William Wagner of Cincinnati, Thomas Kewley of Toledo, O. J. Wheeler, P. A. Fitzpatrick, Sam. Esswine of Columbus, Secretary Edward Gruber, Robert Raitz, Charles Meissner, William E. Gerkins, Allen McClellan, John Schultz and Thomas Manion of Toledo. After disposing of the regular business the following officers were elected:

President, Charles H. Ware of Dayton.

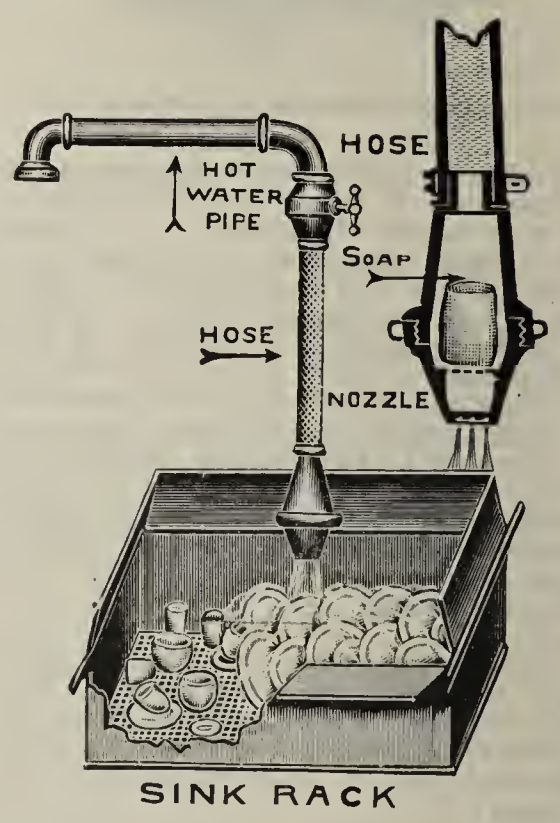
Vice-President, Louis Poplowsky of Cleveland.

Secretary and Treasurer, Frank Clemens of Dayton.

Delegates to the National Convention: Robert Raitz of Toledo and J. Feller of Cleveland.

The Buckeye Dish Washer.

The Buckeye Dish Washer Company, Toledo, Ohio, are manufacturing a device for washing dishes, views of which are shown in the accompanying illustration, the article itself being presented as well as a sectional view through the nozzle and soap receptacle. It will be seen that the washer consists of a sink rack, on which the dishes and table ware are placed, while over it is a hose with a special form of nozzle, the hose connecting at the upper end with the hot water pipe of the sink. This nozzle, which is readily removed, is arranged to contain a small piece of soap about as big as the thumb. Any plumber, it is pointed out, can make the attachment in a few minutes, and as to its efficiency, it is stated that with it 159 pieces have been washed in 40 seconds without wetting the hands of the operator. Furthermore, as the water can be used at the highest temperature, hotter than the hands can bear, the cleaning is more effective and the



The Buckeye Dish Washer.

dishes are quickly dried. During the first part of the operation the soap in the nozzle is dissolved, and after that clear water flows, finally cleansing the plates. In the bottom of the nozzle are ten small holes giving needle jets of boiling hot water, which are thrown upon the dishes with great force where the house pressure is sufficient.

Minnesota State Plumbers.

The annual convention of the Minnesota State Association of Master Plumbers was held at St. Paul last week. The convention was called to order by President Huber Kelly of Minneapolis, and Governor Clough made an address of welcome to the delegates. Among those present were W. E. Goodwin of Milwaukee, treasurer of the National Association of Master Plumbers, who made a short address, in which he stated that papers that were brief, practical and interesting should be read, so that the members might not only be interested in the session, but that they might be benefited and have something worth thinking about after they had returned home. He advised the members to support their local associations, otherwise the work of the State and National associations would be largely hampered. After the reading of a number of interesting papers on sanitary plumbing, considerable discussion was given to the subject of sub-contracting, and it was advised that the members of the association use their efforts to have the contract for the plumbing reserved from the general contract for the building. The report of the secretary showed an increase in membership of 62 during the year, and the report of the treasurer showed a balance on hand of $1008. After disposing of the regular business of the convention the following officers were elected :

President, Hubert Kelly of Minneapolis.
Vice-President, John J. Dwyer of St. Paul.
Treasurer, George A. Kees of St. Paul.
Secretary, Charles Wilkins of Minneapolis.
Delegates to the National Convention, James Doyle of Red Wing and Hubert Kelly of St. Paul.

The following is a complete list of the delegates :

Duluth—A. J. Harker, M. Griffin, William Hoops.
Faribault—E. Eardley, A. L. Carufel.
Mankato—E. I. P. Staed, Edwin Schumacher.
Minneapolis—M. Cody, George W. Hineline, W. C. Hobart, J. S. Kearney, O. J. Ringer, F. H. Schuler, E. E. Sahler, J. C. Stewart, Frank Stepke, W. S. Bayley, W. W. Sykes; A. W. Scott, delegate at large.
New Ulm—Charles Tober.
Northfield—John Sitze.
Red Wing—James H. Doyle, Peter Nelson.
St. Cloud—E. H. Jarrard.
St. Paul—John H. Shea, M. J. O'Neill, John J. Dwyer, J. J. Dunnigan, S. A. Hill, John R. McKee, John J. Bailey, James H. Prendergast, H. S. Krause, John McQuillan; W. P. Hudner, delegate at large.
St. Peter—A. J. Potts, J. M. Peterson.
Stillwater—M. M. Peasley.
Waseca—William Wabschall.
Winona—J. V. Cunningham.
Brainerd—F. J. Murphy.
Owatona—C. J. Clifton.
Lake City—A. C. Meacham.
Le Sueur—J. R. S. Cosgrove.

St. Cloud was selected as the place for holding the next convention. After the convention the delegates were banqueted at the Metropolitan Hotel, John J. Dwyer acting as toastmaster.

NOTES.

Sharper competition has been noted by the larger buyers of Radiator Valves, and compared with last year lower prices have ruled in some of the larger sales that have been made. This is said to be due to a new factor in the selling field making strenuous efforts to gain an entrance to the market.

A meeting of the manufacturers of Cast Iron Soil Pipe was held in New York on Thursday and Friday of this week. At the time of writing the meeting was still in progress and no news of the result was obtainable. It is expected that a higher range of prices on Soil Pipe will be adopted by the manufacturers in view of the recent advance in raw material. Considerable irregularity has prevailed in this department of late, and prices have been cut to such an extent in some quarters that an agreement to maintain a uniform level of prices will be received with satisfaction in the trade.

John W. Roberts has been appointed plumber to the Federal Building at Cincinnati, Ohio.

The Board of Health of Syracuse, N. Y., has appointed Patrick F. McDonald as Plumbing Inspector, the appointment taking effect on March 4, when Inspector Smith's term expires. Mr. McDonald has previously served as assistant to the Inspector.

The master plumbers of Nashville, Tenn., have prepared an ordinance which they have submitted to the Mayor and the Aldermen for enactment, requiring that all plumbers pass an examination and take out a license.

The Iowa Master Plumbers' Association has prepared a bill which has been submitted to the Legislature for enactment.

Some new circulars relative to the O S Distributing Fittings for hot water fitters' use and the Temple Back Vent Fittings for plumbers' use are accompanied by a letter from Oliver Schlemmer, Cincinnati, Ohio, stating that these goods have been used in work by the United States Government with such success that they are now being included in their specifications.

The Master Plumbers' Association of Auburn, N. Y., gave a complimentary dinner at the Avery House on February 11 to William G. Reid, president of the New York State Association of Master Plumbers. The Auburn plumbers are desirous of having the next State convention held in their city and will make an effort to that end at the next annual convention at Binghamton.

William Hochrein succeeds the plumbing firm of Hochrein & Kraus, at 319 South Main Street, Ann Arbor, Mich.

Charles McQuillan and J. G. Mehl have formed a partnership in the plumbing and gas fitting business at 855 Main street, Topeka, Kan.

Daniel Sexton has resigned his position as head plumber of the Carlinville Water Works to engage in the plumbing business at Carlinville, Ill.

T. J. Horn is the proprietor of a new factory for the manufacture of Mineral Wool at Alexandria, Ind.

The partnership in the plumbing and heating business formerly existing between George A. Wiley and David A. Calhoun has been dissolved and the business will be continued by Mr. Calhoun at 60 Union street, Portland, Maine.

John Kelly of the plumbing firm of Weldon & Kelly, Pittsburgh, Pa., sustained a serious injury last week by slipping in the act of going down stairs, falling head foremost.

The Bruce Generator Company have been incorporated at St. Paul, Minn., with a capital of $50,000, to manufacture Gas Generators and Fixtures. The incorporators are V. P. Roberts, Minneapolis; H. B. Cramer, St. Paul Park; L. S. Breher and Charles Karst, St. Paul.

The Supervising Architect at Washington, D. C., will receive bids until March 8 for a low pressure exhaust steam heating and mechanical ventilating plant with cold and hot water supply system and fire pump for the United States Post Office, Court House and Custom House at Milwaukee, Wis.

Clifford H. Smith, whose establishment at Highlands, Mass., was burned out, has purchased the plumbing, stove and tinning business of Frost & Whitcomb, at Athol, Mass. Joseph E. Wood, who has been 16 years with the old firm, will remain with Mr. Smith.

The Burbanks Hardware Company of Cohoes, N. Y., have been incorporated to carry on the business of plumbing, roofing, steam fitting, gas fitting and dealing in Hardware, Stoves, House Furnishing Goods and Bicycles. The capital is $8000 and the directors are Paul H. Andrae, Clara E. Pierce and Adolphus G. Burbanks of Cohoes.

John L. Finnegan has been elected Inspector of Plumbing at Nashville, Tenn.

Morris Barry, Uncasville, Conn., has moved his plumbing and tinning establishment to a new building erected for the purpose.

The usual objection is being made by interested property owners against the ordinance which provides for a Board of Examining Plumbers and Plumbing Inspector at Savannah, Ga.

A. J. Wright and R. L. Dunlap have formed a partnership in the plumbing business at Champaign, Ill.

In *The Metal Worker* of February 5 we stated that H. M. Page had opened a plumbing shop on Larimer street, Cheyenne, Wyo. This, however, was a mistake, Mr. Page starting in business at 1715 Larimer street, Denver, Col.

The committee appointed by the Business Men's Club of San Antonio, Texas, to solicit subscriptions to defray the expenses of the National, Southern League and State associations of master plumbers' convention, which

meets in San Antonio April 11 to 16, inclusive, consists of Ed. Steves, Prof. Carl Beck, Ed. Braden, Jr., and William C. Schuwirth.

Judge Sutherland of the Superior Court, sitting at Milwaukee, Wis., has rendered a decision in the suit to test the validitv of the State plumbing law, in which he cites the discriminations it makes which destroys its validity. The case will be carried to the Supreme Court. The following statement is from the decision: I cannot too strongly emphasize the fact that appropriate laws with reference to the examination and licensing of plumbers are both beneficial and necessary. But a law which attempts to provide for such examination and licensing, which contains in itself discriminating provisions, cannot be upheld. The law ought to provide that every person who seeks to do business as a master plumber shall, by an appropriate examination, show himself qualified to be a master plumber, and that every person, no matter whether he is a member of a firm or a corporation, who lays his hand to the practical work of plumbing should also pass an examination, showing himself qualified to do that particular work—not the work that somebody else is to do; and that no one, no matter in what capacity he seeks to do work or how he may be associated in business with others, should be permitted to escape the provisions of the law.

The small town of Totis, in Hungary, claims to be the first town which has adopted municipal lighting by acetylene gas. Not only streets and squares are being lighted in this manner, but also several houses, and on the occasion of the recent visit of the German Emperor, the park of the royal shooting box, the effect being excellent. Among other places Vienna is contemplating making experiments with acetylene gas lighting on one or two of the large squares.

George H. Keeler, Hammondsport, N. Y., has disposed of a half interest in his business to Daniel Albright, and the style has been changed to Keeler & Albright. A full line of Hardware is carried, plumbing and steam fitting being also done.

W. F. Porter & Co., 210 Third street, South, Minneapolis, Minn., have been making a specialty of combination Hot Air and Hot Water Heating Plants, and have been doing a large business during the past winter.

The St. Louis Radiator Mfg. Company have appointed A. C. Stiles their agent in Chicago. His office is located in room 453, The Rookery. This appointment is regarded as evidence that the company's interests in Chicago are to be vigorously pushed.

The Detroit Furnace & Heater Company, Detroit, Mich., will have several new constructions ready for the market soon. Among them will be a line of Vertical Sectional Boilers and a Wood Furnace. They report an unusual demand for their goods in what is considered a very dull time of the year.

The annual banquet of the Master Plumbers' Association of Boston and vicinity, held at the American House on Monday night, was attended by 120 members and guests, and was made the occasion for presenting William Lumb, the oldest master plumber in the city, with a gold headed cane. David Smith, chairman of the Committee of Arrangements, made the speech of presentation. Speeches were also made by David Craig, president of the association, and Vice-President Edwin Mills. Mr. Lumb is 79 years of age and has worked at the trade for 65 years, having entered his apprenticeship when he was 14 years old.

The Master Plumbers' Association of Newark, N. J., held a very enjoyable smoker and supper at Achtelstetter's Hall, in Newark, on February 16. It was largely attended by the members of the association, although a very cold night. After the supper the guests were entertained with music and variety artists. President Ira H. Budd presided at the supper, and was assisted by A. Selden Walker, F. J. Sturn, Louis Stevens, Robert Berla, C. Sullivan, F. J. Koether, W. Champlain and F. Lang. Winslow Zelliff, national State vice-president for New Jersey, was the guest of honor on the occasion.

N. M. Fell has purchased the plumbing business of M. F. Hinman, at Malone, Pa.

Wiliam E. Alford and R. Frank Lawder are a new firm in the Gas Fixture and plumbing business in the new building at 105 West Fayette street, Baltimore, Md., where they are making a handsome display.

W. R. Armstead has moved his plumbing establishment to 104 South Fourth street, Leavenworth, Kan., and now enjoys a more central location in the city.

A. W. McDougal, 44 Centre street, the New York manager of the William F. Haines Company, Philadelphia, Pa., has recently hung out an imitation of the Heinze Steam Saving Trap as a sign that heating contractors may readily locate him. Mr. McDougal reports that trade for the Trap is increasing wherever it has been used so that its operation may be learned. He invites an investigation by the trade who may visit New York.

Senator John Fertig, president of the Titusville Iron Company, Titusville, Pa., was the guest of W. C. Joy, their New York manager, at 152 Centre street, this week.

Fred. D. Johnson of Fred. D. Johnson & Co., 80 Centre street, New York City, has recenty returned from an extended trip among the users of steam goods and reports a good trade on the Frontier and Weber Valves for steam and hot water work, for which he is the general sales agent.

Joseph Shaller has opened a plumbing establishment at South Natick, Mass.

Major John Aldrich has sold his interest in the plumbing and gas fitting supply house of W. B. Stevens & Co., at Lakeport, N. H., to Irving O. Sanborn.

Geo. B. Cobb, 44 Centre street, New York, was elected vice-president of the Roberts Machine Company at a meeting of the directors held at Collegeville, Pa., this week. Mr. Cobb will look after the interests of the Roberts steam and hot water heating apparatus.

C. F. Hauss, manager of the New York office of the Richmond Stove Company, recently visited the Iron City Heating Company, Pittsburgh, Pa., and saw a number of Richmond Boilers in use where natural gas was used as fuel and rendering good service.

Frank C. McLain of the J. H. McLain Company, Canton, Ohio, is now settled in his quarters at 82 Centre street, New York City, and is showing samples of their full line of steam and hot water heating apparatus, in cluding the Cornell, Cambridge, Amherst, Princeton, Humber, Yale and Sandow Heaters, and is ready to extend a cordial welcome to the heating contractor who visits New York City.

Gaylord & Eitapence of Binghamton, N. Y., were awarded the contract for the heating, at $4873, and the plumbing, at $1550, of the new building for the State Hospital at Binghamton.

Pipe Hanger.

Beaton & Corbin Mfg. Company, Southington, Conn., are putting on the market the pipe hanger shown in the



Pipe Hanger.

accompanying illustration. The hanger is made of sheet steel, and its simplicity, lightness and strength are emphasized by the manufacturers.

President Diaz of Mexico is making arrangements for a visit to the United States, in the course of which he proposes to visit all the important cities of the Union.

A movement for the formation of a Southern Confederacy of Labor is meeting with decided opposition among the labor organizations of the South. Among others, the Atlanta Federation of Trades have passed a resolution declaring emphatically against the proposal.

A boom in Southern timber lands is in progress. Many large sales have been made recently, Northern and English capital being mainly represented in the deals.

SHEET METAL WORK.

SLATE AND COPPER ROOFING ON FIRE PROOF BUILDINGS. VI.

BY WILLIAM NEUBECKER.

SECURING HIGH CAP FLASHINGS ON SLATE ROOFS.

The method of fastening high cap flashings on a slate roof is illustrated in Fig. 32. After the roof beams are laid the wall is topped out, and in some cases the entire wall is covered with a cap flashing, as shown. After this has been done the coping is laid by the mason and the roof planked by the framer, or covered with fire proofing, after which it is ready for the slater. The illustration indicates the manner of securing the cap flashing at the bottom and obtaining a water tight joint between the gable wall and roof by means of slate step or shingle and cap flashing. Referring to Fig. 32, let A B C represent the gable wall and D E F the copper cap which is placed on the wall as shown. Over it the coping is laid in cement. H J is the roof planking or fire proof terra cotta blocks, K L M N the slating, R V X X the step or shingle flashing and O P S the brass clasps. A water tight joint is obtained between the roof and wall as follows: Let M N be the slate, showing the nailings, which are covered by the upper course Y. The shingle flashing which has been slated in with the courses K and L is shown by X X. The shingle flashing which has been slated in the slate N is indicated at V, while R shows how the shingle flashing overlaps the previous flashing V and is nailed at the top. Over the flashing R is placed the brass clasp S,

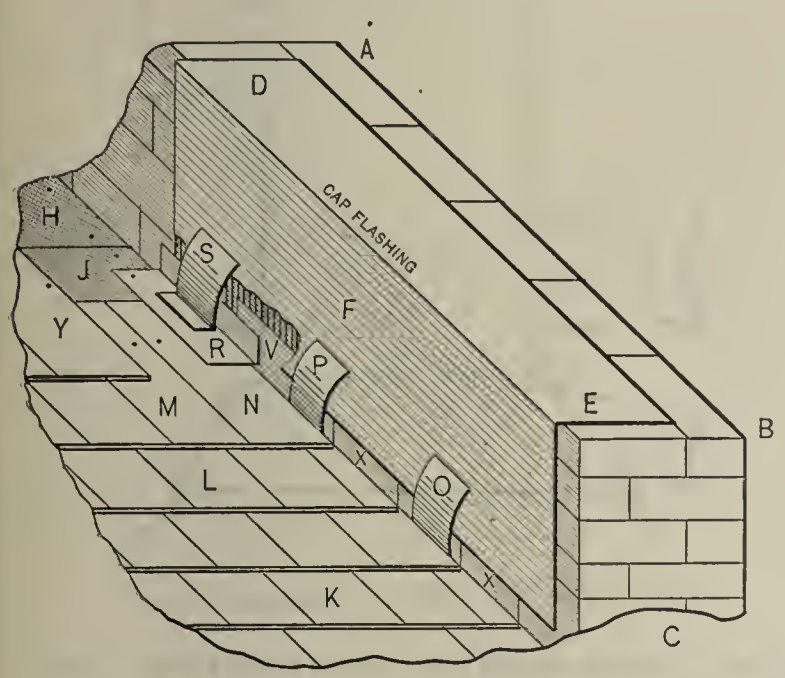


Fig. 32.—Method of Applying Brass Clasp to Secure Cap Flashing.

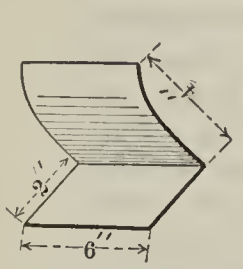


Fig. 33.—View of Brass Clasp.

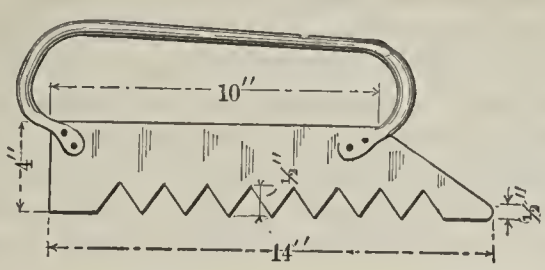


Fig. 34.—Sheet Steel Mortar Saw.

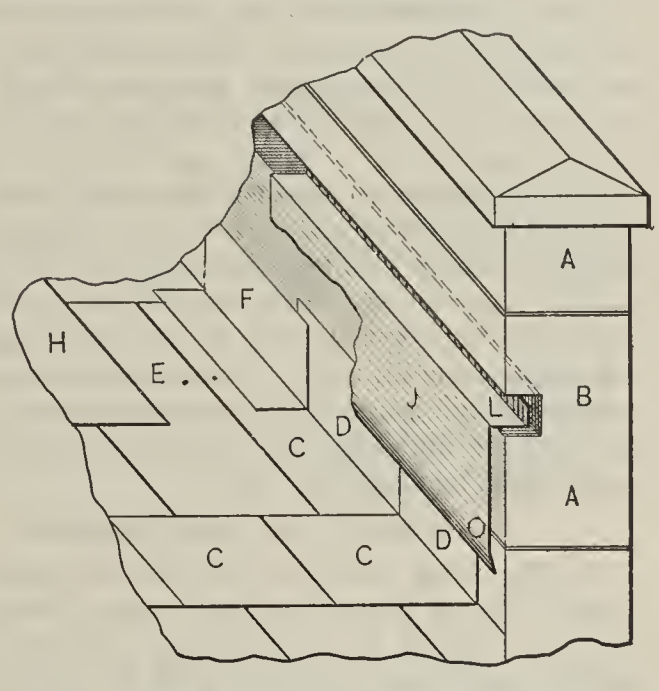


Fig. 35.—Method of Fastening Cap Flashing in Stone Wall or Slate Roofing.

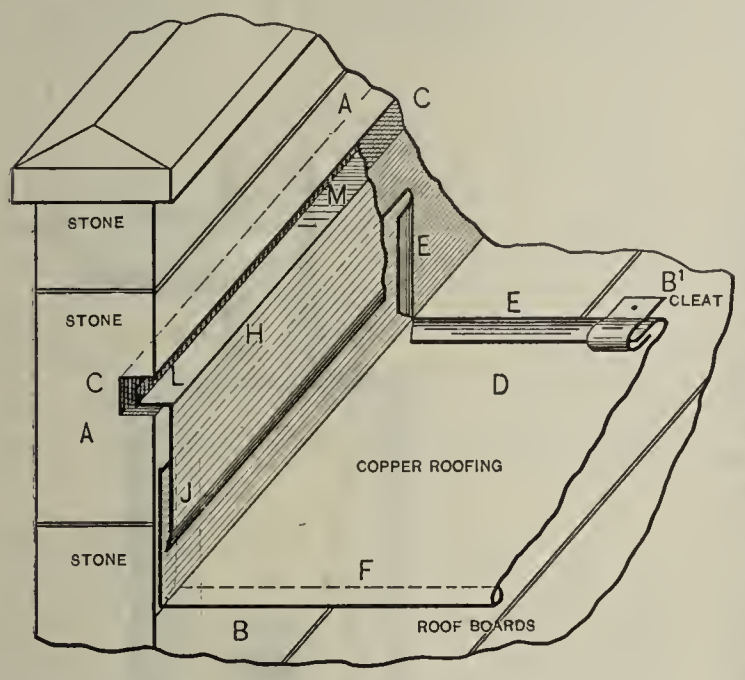


Fig. 36.—Method of Fastening Cap Flashing Into Groove Cut in Stone Wall, on Copper Roofing.

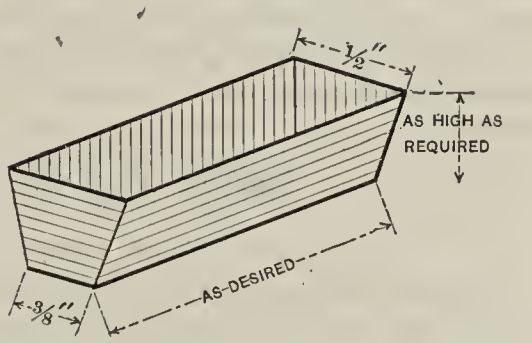


Fig. 37.—Black Sheet Iron Die, for Casting Lead.

made of 1-16 inch hard brass of the shape shown and slated in at every other course, or as many as required to keep the cap flashing close over the step or shingle flashing. The slate is now laid and nailed over the flashing R and clasp S, as in the case of the clasps O and P. Care should be taken to have the step or shingle flashing go up under the cap flashing at least 3 inches to prevent the snow blowing under. In Fig. 33 is shown a brass clasp used in connection with work indicated in Fig. 35. Some times the gable walls are so high above the roof that it would not be advisable to put on a full cap flashing, owing in the first place to the expense, and in the second

place to the action which the sun and cold would have, causing a succession of buckles. Thus in the above case a cap flashing is put into the wall after the wall is finished, allowing it to lap sufficiently over the step flashing and about 1½ inches into the joint of the brick work, using wall hooks and roofers' cement to make a tight joint. The joint between the bricks is often cut out with a hammer and chisel, but a better and quicker way is the use of what is known as a sheet steel mortar saw, shown in Fig. 34, and giving full size measurements. It is made of a piece of sheet steel with the teeth cut as shown, having a handle made of round iron, flattened at the ends to allow it to be riveted to the saw. It is operated the same as a saw, working right and left into the joints.

FASTENING CAP FLASHING INTO STONE WALL.

In Fig. 35 is shown the method of fastening a cap flashing to a stone wall over a slate roof. A A shows the stone wall and B the groove, which is cut into same about ½ inch wide and 1 inch deep. C C C E H shows the slating in the various progress of the work and D D F the step or shingle flashings. J represents the cap flashing, with a slight bend at O, so that it will lay tight against the step, and bent at the top as shown at L. The edge L is then placed into the groove B and wedged in tight with cast lead wedges, made tight with the calking chisel and hammer.

FLASHING FOR COPPER ROOFING.

In the same manner in Fig. 36 is shown the method of securing copper roofing and flashing between a stone wall and roof. A A represents the stone wall, B the roof boards and C the groove, which is cut into the stone work as before explained. D shows part of the copper flashing or roofing, flashed up against the stone work as shown, having a lock bent upward at E E on which to lock the next sheet, and a lock bent downward at F, which locks into the lower sheet. H shows the cap flashing having a small edge bent at the bottom at J, as shown, and a top edge bent as at L and M, and is let into the stone groove. It is made tight by means of lead wedges fastened by means of the hammer and calking chisel, the copper roofing being fastened by cleats B^1.

CASTING THE LEAD WEDGES.

In Fig. 37 is shown a die used for casting the lead wedges. These dies or pans are made of heavy black iron as long as desired, the usual length being 24 inches, ½ inch wide at the top and ⅜ inch wide at the bottom. By making the wedges tapering the cast lead falls out easily when turned after cooling, and can be easily put into the stone groove. Any old lead pipe can be melted for this purpose. Care should be taken to place a number of these pans between strips of wood, to keep them from twisting when casting.

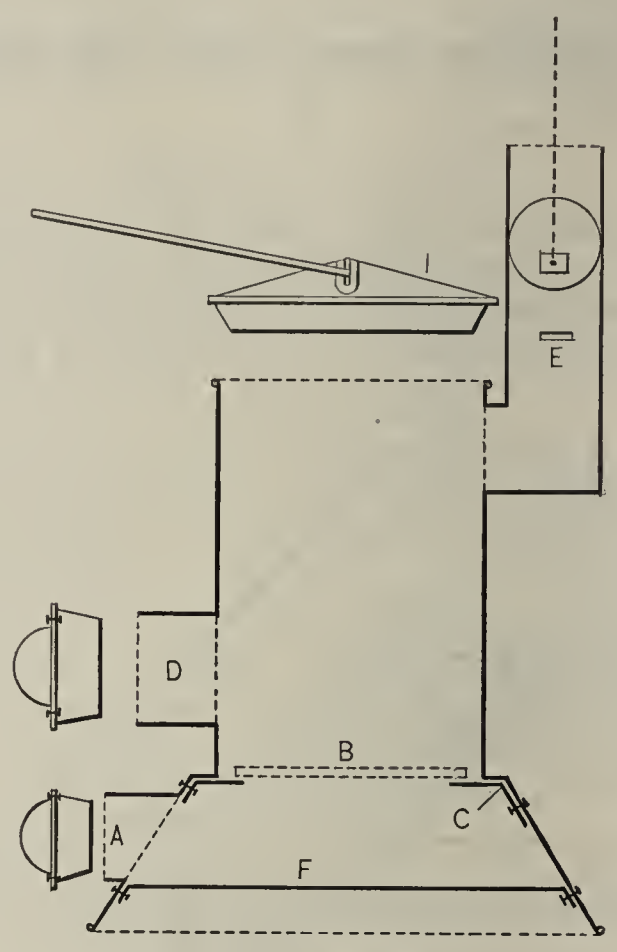
TINNERS' FIRE POT.

BY OLIVER TWIST.

A tinners' fire pot that has some advantages peculiar to itself is shown in the accompanying illustrations, which I hope will prove of value to "E. E. H.," St. Louis, Mo., who made inquiry in *The Metal Worker*, January 22. It is simple in construction, and can be made by the average tinner without any trouble. The difficulty with most fire pots for burning charcoal, &c., is that they are more or less wasteful, because they are not sufficiently air tight. Very often the tinner is called away from a good fire and hot soldering coppers to attend to some other work for a time, and on his return finds the fire out, and what is worse, his fuel gone.

Fig. 1 gives a sectional view from the side. The body can be made from 24 gauge black iron, and is 8 inches in diameter, 12 inches high and wired with quarter rod. The base is a frustum of a cone, 15 x 10 x 5 inches deep when finished, heavily wired and provided with a false bottom, F, riveted in, leaving a rim 1½ inches high, which is perforated with ¾ inch holes, as seen in Fig. 2. This forms an ash pit, from which the ashes may be removed at A, which is 3 inches in diameter and has an air tight plug. B is the fire grate, for which we can always find something suitable in the scrap pile, and which is supported by band iron lugs, as at C, or two straps may be placed across at right angles to each other.

Make a cylinder 4 inches in diameter and cut it so as to fit the pot, giving it a projection of 4 inches, secure it in



Tinners' Fire Pot.—Fig. 1.—Sectional View.

place and fit it with an air tight cover with a good handle riveted to it, as shown at D. This gives lots of room for even large coppers. The smoke pipe is 3 inches in diameter, leaving the pot about 1 inch from the top, having a close fitting damper, E. I have found in practice

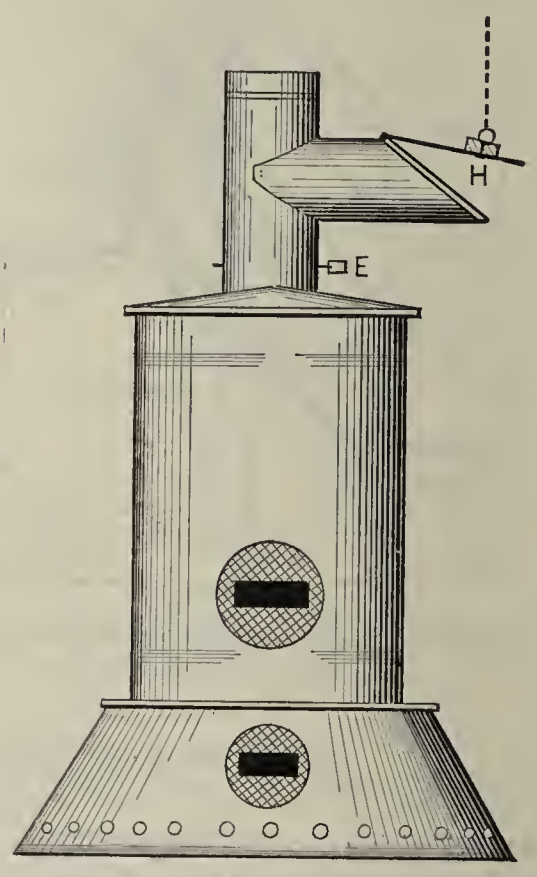


Fig. 2.—General View.

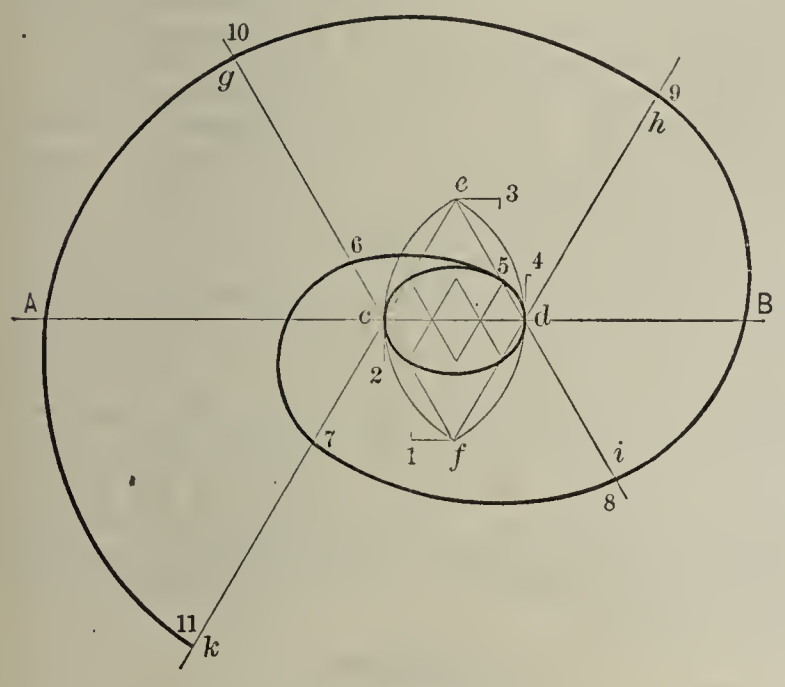
that a check damper was beneficial, so a 3 inch tee should be made, cut on the bevel and fitted with a hinged cover with a weight and hook fixed, all as shown at H, so that by means of a small chain it can be hooked up when needed. Make a good fitting cover, I, with the rim a little flaring, so that it may be removed easily, and fit it with a long wire handle, which will save somebody's fingers from being burned. Fig. 2 shows the general appearance from a front view. It was made for shop use and stands in a

shallow square pan 16 x 20 x 1½ inches deep, which keeps the bench clean and safe. When called upon to leave the fire, remove the coppers from D, put in the plug, shut damper E and leave H open, which will so check combustion that the fire will be held a considerable time. By fitting it with a bail and leaving off the check damper it makes a first-class pot for outside work and is very light.

Drawing an Oval Scroll.

We are indebted to George Kummal, 772 Columbia avenue, Baltimore, Md., for an interesting letter in which he describes a method of drawing an oval scroll that will be interesting to many of our readers. We present below Mr. Kummal's letter and have reproduced the drawing which he sent with it:

I have been looking through some German books and I found how to draw an oval scroll, and send herewith a sketch of the same, from which it is possible a rule can be



Drawing an Oval Scroll.

worked out. On the line A B take two points *c* and *d*. Describe arc *e f* and draw the line *f c g*, *f d h*, *e d i* and *e c k*; also draw the lines *d*4, *e*3, *c*2 and *f* 1 any equal distance. With one leg of the compass at the point 1 describe the arc 5 6 ; set compass at the point 2 and describe the arc 6 7 ; set on point 3 and describe the arc 7 8 and continue in this way. Always transfer the compass to the next point of the four points previously determined. This method I found in the book of Dr. Burgheim, architect in the Drawing Academy of Minden, Germany, 1861. The author's name is Vignola, an Italian, born 1507, died in Rome 1573. I found this an interesting method, and perhaps some of the readers of *The Metal Worker* will care to see it.

Tinsmithing Fifty Years Ago.

In the article in *The Metal Worker* of February 12, from John Brett, Millington, Mich., there were certain errors in the table as published, which are corrected in the following letter which we have received from Mr. Brett : 14-quart pails or dish kettles should be 16 for a day's work, and boilers 50 cents a dozen should read 50 cents each, and the price for tea kettles was 37½ cents each. The price of piece work should read 62½ cents, not 67½ cents, a day's work, up to 88 cents. The use of pit bottoms was only intended to refer to tea kettles and boilers.

FLASHINGS.

The Newark Cornice & Skylight Works have been incorporated by Henry W. Egner, Henry Teuscher, George Schwing and Gottlieb Runker of Newark, N. J. The capital stock is fixed at $12,000, of which $4000 will be immediately available for the business.

Henry C. Messenger, a leading business man of Conshohocken, Pa., died in that town on February 22, aged 74 years. He was born in Germany and came to this country at an early age. In 1855 he started the Tinware and Sheet Metal business at Conshohocken, which he carried on up to a few years ago. Mr. Messenger served as Town Councilor and Burgess of Conshohocken, and was interested in many local enterprises.

Mooney Bros., 313 Main street, East Orange, N. J., are erecting a new store and would like to have estimates of the cost of metal ceiling and siding.

Cowgill & Badgley are a new firm entering into the Tin, Sheet Metal and Coppersmithing business at Terre Haute, Ind. They will make a specialty of Roofing Materials and Sheet Metal Ornaments, Elevator Buckets, Conductor Pipes and Eave Troughs. They will also do a Hot Air Furnace and Stove business.

Gustav Schwinn has withdrawn from the partnership existing under the firm name of George W. Schwinn's Sons. Alfred Schwinn will continue the Sheet Metal and Cornice business under the name of George W. Schwinn's Son.

The Denison Tin & Cornice Works, Denison, Texas, have contracted to put the Slate, Copper and Iron Cornice work on St. Patrick's Church, Denison ; also the Iron, Tin and Ornamental work of the Owen McCarthy Block on Main street.

The Apollo Iron & Steel Company of Pittsburgh, with mills at Vandergrift, Pa., are making large additions to their capacity for the manufacture of Apollo Galvanized Sheets.

The Weir Reeder Sheet Iron Company have been incorporated at Louisville, Ky., to buy, sell and manufacture Sheet Iron The capital stock is $10,000, and the officers are William Weir, president ; Joseph F. Reeder, secretary and treasurer, and James A. Starr, general manager.

L. W. Bosley of Gainesville, Texas, has patented a Stove Pipe Groover with mandrel attachments, which he hopes to put on the market before very long.

Missouri Sheet Metal Ornament Company of St. Louis, Mo., have been incorporated, with a capital stock of $12,000. The incorporators are Frederick Buel, A. C. Fuellee and John Kuengler.

The Challenge Machine Company have been incorporated at Camden, N. J., for the purpose of manufacturing and selling machines for working metals. The capital stock is $50,000, the incorporators being F. N. King, J. W. King, B. F. Baird, E. C. Regn of Philadelphia and William F. Fithian of Camden, N. J.

The sheet mills in general are reported to be very busy. Some say they have not had as much work on their books for years as they have to day, and much of it is for quick delivery. Galvanized Sheets are in particularly active demand all over the country, and some heavy orders are being placed for Black Sheets.

The Light of the Firefly.

Prof. H. Muraoka, a Japanese scientist, who occupies the chair of physics at the University of Kioto, has recently made some interesting experiments regarding the properties of the light emitted by the firefly, or lightning bug. The method pursued by the professor was to place from 300 to 1000 fireflies in a small flat box under a hemp net. The box also contained a photographic dry plate, between which and the fireflies Professor Muraoka placed various substances consisting of metal, paper and wood. After wrapping the box carefully with several thicknesses of black paper he left it for two nights in a photographic dark room, from which all sunlight and artificial light was carefully excluded. In the result it was found that the light of fireflies possesses all the properties of ordinary light. The professor also found that rays are given out which resemble the Röntgen rays in their special penetrating powers. Recent investigations have shown that a very marked resemblance exists in these rays to the light of fluorescent bodies.

The following recipe for cleaning and polishing brass work is given by an exchange : Take 1 ounce of oil of vitriol, ½ gallon of sweet oil, 1 gill of powdered rotten stone, 1½ pints of rain water. Mix and shake well before using. Add to the mixture ½ ounce of nitro-myrbane to make it fragrant. Put on with cotton waste and polish with woolen or chamois.

The Meriden Machine Tool Company of Meriden, Conn., issue a finely illustrated catalogue and price-list of the extensive line of forming lathes and tools which they manufacture. These lathes are all illustrated by half-tone and line engravings and full descriptions accompany the illustrations.

A trolley line, 35 miles long, is to be built from Penn Yan, in Yates County, N. Y., by way of Geneva, to Lyons, N. Y., by Baltimore capitalists.

TIN PLATES.

Decrease in the Value of Mills.

In the event of the scheme for a combination of the tin plate manufacturing interests being carried to a successful issue, it would involve either the buying up or the exclusion of those mills which, by reason of unfavorable location or from the antiquity or inefficiency of their equipment, could not be profitably run as a part of the combination. The owners of the majority of such mills would probably look with satisfaction upon a proposal to sell out, provided the recompense was large enough to meet their ideas. But this question of compensation would be likely to prove a stumbling block of large proportions. The valuation of old fashioned mills to-day would fall materially below the valuation placed on them by their owners four or five years ago, and would be, in most cases, much under the actual initial cost of the plants. Practical mill men assert that a completely equipped modern tin plate plant can be erected at a cost not exceeding $25,000 a mill. A few years ago the cost was nearer $40,000 a mill, and the mills then put up were not the equal of those of improved type erected to-day at a cheaper cost. Naturally, therefore, differences would arise when it came to a valuation of the plants. To avoid trouble on this score, it is reported that the unfavorably circumstanced tin plate plants will be left out of the combination altogether. It is argued that if they remain independent they could not compete to any extent worth consideration with a combination of strong mills, while if absorbed they would be an extensive burden on the central company. Should the weak and antiquated plants be left out of the combination they must either compete at an immense disadvantage or collapse. They would seem to be "between the devil and the deep sea" in any case. But the combination is still a long way from being an assured fact, and the makers referred to are not borrowing trouble over the matter just yet. Some way may be found whereby they may come out on the right side, even if the combination does materialize and they are left out in the cold.

New Black Plate Mill.

The black plate mill of Hamilton & Co. at West Newton, Pa., which has been in course of construction for some months, has been completed and was put in operation last week. The plant is a very complete one, having modern equipment throughout. The main building is 130 x 100 feet, and is of iron and steel. It contains two hot mills 24 x 32 inch and three cold mills 22 x 32 inch. It is fitted up with a Shaw electric crane, while the rolls are driven by a 36 x 60 inch Corliss engine, built by the E P. Allis Company, Milwaukee, Wis. Another engine, built by the Buckeye Engine Company, Salem, Ohio, drives the dynamos, shears, &c. The pickling house is 40 x 40 feet and the boiler house is of the same size. The plant is so constructed that a switch leading from the Baltimore & Ohio Railroad is built to one end of the main building, on which sheet bars are received, and they go right through the different processes, being finished into black plate at the other end of the building. There is thus no rehandling of material. The facilities for getting coal are of the very best, a track through one side of the building dumping the coal right in front of the furnaces direct. The entire plant has been built with a view of securing the very lowest possible cost in the production of black plate for tinning. The output will be about 15 tons per day. It will be used by John Hamilton and C. W. Cadwallader, makers of tin and terne plates, whose plants are located at Hazelwood, Pittsburgh.

New Method of Rolling Tin Plate Bars.

The Carnegie Steel Company, Limited, of Pittsburgh for some time have been rolling tin plate bars in rolls of a peculiar contour, by which, it is claimd, they are rolled more truly to weight than is done by the common rolls. A large quantity of these tin plate bars have been exported to Wales, and bars as wide as 10 inches have been rolled. The method employed is that of lateral rolling. the billet being spread to the desired width by the peculiar contour of the different passes, five of which are customarily employed. In the first pass, which receives the square billet, the rolls have non-registering projections, which form similar non-registering grooves in the billet, one above and one below, which give it a cross section of essentially **Z** shape if viewed sidewise. The next pass flattens the ends of the **Z** out so that the contour is essentially **S** shape. The two following passes still further spread the metal, at the same time opening up the angles or curves so that at the final pass little work is required to reduce the section to a flat. It is believed that this method besides being advantageous from the fact that a square billet can be employed, forces the metal into the corners better, and thus produces a more uniform section. Many years ago an effort was made in this country to get rolling mill men to take up an English idea which embraced lateral rolling, the shape of the pass being essentially of a **W** form. Both edges of the bar thus abutted against the same roll. The idea was not taken up extensively, however. The present method employing the **N** shape is different, in that the edges of the bar abut against opposite rolls. The idea has been patented, December 28, 1897, No. 596,403, by Joseph Guest, roll turner at the Homestead Steel Works of the Carnegie Steel Company, Limited.

SCRAP.

Tin Plates are still the Cinderella of the metal trade. A tame demand and an unsettled and weak market is the report this week, so far as the East is concerned. A better condition appears to exist in the West, however, although the prices at which orders have been taken are far from satisfactory.

There has been quite a slump in the market for Tin Plate Scrap in the past week or two, and, as noted in our trade report, the price has dropped about $1 a ton. Practically all the Scrap Tin turned out from the big Tinware and can factories has been sent to Antwerp and Germany for treatment in the reducing works. It appears that this business has received a temporary check, and the export firm who handle most of the Scrap sent abroad are not now buying any quantity of the material. The reason given is that there is for the time no market for the Scrap steel which remains when the Tin is extracted, and this material has piled up on the other side to the extent of some 3000 tons, making it unprofitable to carry on the work of reduction. Hitherto the Steel Scrap has been readily sold, and it is thought that it will again find a market later. Meanwhile the market for Tin Scrap is completely flattened out. On the other hand, an active demand exists for Tin dross, both for home and foreign consumption.

As noted in our trade columns, there has been recently a sharp advance in prices of the higher grades of palm oil, such as are now generally used in the manufacture of Tin Plates. According to one of the largest dealers in this line in the country, the Tin Plate makers, in the course of experience, have found it most economical to use only the very best quality of palm oil in their tinning pots, and have generally discontinued the use of the cheaper kinds. The active condition of the Tin Plate industry has brought about such a large demand for the higher grades of the African product of late that there is a shortage in the market, and prices have risen accordingly.

The impression which has gone abroad that the effort to form a combination of the Tin Plate mills is in abeyance seems to be erroneous. We learn from a reliable source that the Committee of Four who have the matter in hand are still briskly at work, and moreover that they entertain very lively hopes of the ultimate success of their labors. Two of the members of the committee were laid aside for a few days by sickness, but both are again

devoting their active attention to the work in hand. It is understood that the plan of combination is supported by the large majority of the effective mills, and the promoters of the scheme count on securing the co-operation of at least 75 or 80 per cent. of the total capacity now in operation.

The Tin Plate mills, as a whole, are reported to be running full. Many of them are said to be supplied with orders enough to keep them going for the next three months, and buyers have no difficulty in placing contracts for deliveries well into the second half of the year. This does not look as though an early consummation of the consolidation scheme was anticipated.

The import and export returns of the United States for the calendar year 1897 show an importation of Tin Plates amounting to 83,851 tons, valued at $4,366,828, as compared with 119,171 tons, valued at $6,140,161, brought into this country in 1896. A small quantity, 2,951,473 tons, is shown to have been re exported in 1897, being probably in transit to Canadian points. The report of the Bureau of Statistics unfortunately does not contain the statistics for exports of Tin Plate under the drawback clauses, which are estimated in the trade to be about 40,000 to 50,000 tons per annum.

A San Francisco correspondent, under date of February 14, 1898, writes as follows regarding the Tin Plate trade of the Pacific Coast: "Our imports of Tin Plate of late have been large by rail and by sea, too. For the past two weeks we have been in receipt of 14 whole cars, or 6657 boxes, mostly to one big company that manufacture a great deal of cans used in putting up the fruit, meat and salmon, as well as the vegetable pack of the coast."

The wage dispute at the sheet mill plant of the Reeves Iron Company, Canal Dover, Ohio, has been settled by the company agreeing to pay the regular scale for rolling Black Plate.

The Pittsburgh offices of John Hamilton, manufacturer of Tin and Terne Plate, will be removed on April 1 from 122 Third avenue to Hazelwood, Pa., where the Tin Plate plant of Mr. Hamilton is located.

W. F. Janeway, Columbus, Ohio, sends us a handsome half-tone engraving of the new Biological Building of the Ohio State University, at Columbus, Ohio. This building is covered with Conesera Tiling, requiring the best Tin available for the valleys and gutters. Janeway's Franklin brand of Terne Plate was specified for this purpose.

It is proposed to have a celebration in New Castle, Pa., when the new 30-mill tin plate plant of the Shenango Valley Steel Company is completed, which is expected to be in June or July. The celebration will take the form of a centennial, from the fact that it is just 100 years ago since the first settlement was made on the site on which New Castle now stands.

The Welsh Tin Plate works, according to last accounts, were suffering from a scarcity of Tin Plate Bars. Some mills had been shut down temporarily for want of material.

A bill has been introduced in the Maryland Legislature prohibiting the use of acid and other injurious substances in the manufacture of Tin Cans used for the packing of food and food products, or in the capping or sealing of such cans. Violation of the law is made punishable by a fine of from $100 to $500, or imprisonment for from one to six months. To carry the law into effect the office of Inspector of Sheet Metal Cans is to be created, the Inspector to be appointed biennially by the Governor of the State. His duty will be to visit the Can factories and packing houses and cause the arrest of all offenders against the law. The bill has the indorsement of the Baltimore Federation of Labor.

It is intended by the National Association of Manufacturers to open a sample warehouse for the permanent display of American manufactured goods at some large European business center. Hamburg, Germany, will doubtless be selected, although there are members who prefer London and other centers. J. H. Cummings, the association's special representative, has just returned from Hamburg, and reports the opportunities offered there as most favorable.

The report of the Department of Buildings of the former City of New York for 1897, just published, shows that during last year plans were approved for the construction of 3502 buildings. The estimated cost of the buildings was $84,398,164. Plans for alterations numbered 1790, at an estimated cost of $7,462,083.

A bill passed in October last by the Swiss National Council providing for the State purchase of the railways of Switzerland, at a cost of about $200,000,000, has received the popular approval by referendum. There are about 2300 miles of railway open for traffic in the country. The Government is projecting a loan for the purchase.

Mica and Its Uses.

Invention remarks that the recent formation in London of the Mica Mfg. Company, to acquire the mineral rights of mica properties in Canada, directs attention to the general uses of this interesting and useful mineral, or, rather, group of minerals. The name mica signifies to shine or glitter, and the word micas is applied to a large class or group of finely foliated minerals, of a pearly luster, and transparent and translucent, tough and elastic. The distinguishing features are their brilliant luster or glitter and the readiness with which they can be split or cut, to any desired thickness, into transparent plates. These laminæ can also be cut or divided with the aid of an ivory or steel knife, and so thinly that the sheets may be only one-two hundred and fifty thousandth part of an inch in thickness. Another remarkable property of the micas besides their distinct cleavage in one direction is their great elasticity and toughness. Mica in the combination of elasticity and toughness is probably excelled by nothing natural or artificial.

The group of micas can be classified in two divisions: Muscovite or biaxal, and magnesia or uniaxal mica. Muscovite or biaxal mica is in color amber, black, brown, white, silvery white, red, violet, gray and green (green and black being the usual tints), with pearly, metallic luster. It can only be fused on thin edges before the blow pipe, and has very tough and flexible leaves. It consists of silica, 46.3 per cent.; alumina, 36.8 per cent.; potash, 9.2 per cent.; peroxide of iron, 4.5 per cent; fluoric acid, 0.7 per cent., and water, 1.8 per cent. Muscovite mica varies in hardness and in density. Magnesia or uniaxal mica (also called biotite) is in color brown, reddish, yellowish brown, olive green, gray, with pearly luster. It whitens in the blow pipe flame, and melts on thin edges. Its hardness and density are identical with muscovite mica, and it is also so tough and elastic that it can be split or cut into sheets of tenuity. In magnesia mica a certain proportion of magnesia replaces alumina, which is present to the extent of about 15 per cent. Magnesia mica is generally found in limestone. Other varieties of mica are the fuchite, a green mica, containing chrome; plumose mica, in which the scales are arranged in a feathery form; and rubelland, which is a name given to red mica. Granite is composed of crystals or crystalline masses of mica, quartz and feldspar. Mica is often confused with talc. But it differs from talc inasmuch as it affords thinner folia, and is elastic, and has not the same greasy feel. Then, again, talc will yield to pressure or indentation, while mica is nearly as hard as calcspar.

Mica is sometimes found in plates 2 or 3 feet in diameter and perfectly transparent, in which state it is well adapted for use as a substitute for window glass. Its common use in this way in Siberia has procured for it the name of muscovy glass. It was formerly much used in the Russian navy, on account of its elasticity, rendering accidental explosion by percussion or concussion well nigh impossible. Mica ground in a mill increases vastly in bulk and forms a loose mass of scales, not unlike bran. In this form it is largely used in a mica powder as an absorbent of nitroglycerine, its peculiar elasticity rendering explosion impossible, while it does not interfere with the power or energy of the nitroglycerine when exploded by a fulminate or other similar device. Mica, coarsely pulverized, is found to be an excellent roofing material, to which use it is also applied in the same manner as slate. It is also used in pulverized form for calico printing and for decorating porcelain and glassware. When finally ground and reduced to powdered form, mica has a slippery and greasy character, and makes a good lubricant for railroad axles, bicycles, &c., and for all machinery requiring high speed. It keeps the bearings free from heat, even at the greatest speed, and in the form of axle grease for railway cars, &c., it meets all requirements. Scrap or refuse mica, which has hitherto been regarded as valueless, is now used as a most efficient covering for steam boilers and pipes, on account of its non-conducting quality. Mica is also very largely used for electrical machinery, its insulating power being superior to that of any other substance. It will stand the highest test of heat, and is infusible, tough and non combustible. In this use the Canadian mica, more generally known as amber mica (being of amber color), is the most in demand in Canada and the United States.

The Canadian Government has refused an offer of agents of the Rothschilds to build a railway into the Yukon gold district. The Rothschilds offered to construct a road to Pyramid Harbor, by way of the Dalton trail, a distance of 100 miles, in return for a grant of 5000 acres of mineral lands.

THE RETAIL STORE.

New Fire King Broiling Range.

The engraving herewith shows the new gas range which A. Weiskittel & Son, Baltimore, Md., are bringing out. It is made in two sizes, with ovens 12 inches and 16 inches wide respectively, to be known as Nos. 75 and 85 in their line of Fire King gas ranges and stoves. In construction the range differs somewhat from the usual style of gas range, the broiling oven being located near the top instead of at the bottom, as ordinarily, a very convenient feature. The ovens in both sizes are 16½ inches deep, which makes the range especially convenient for use in apartment houses or other places where space is limited. The regular burners are of the loose top Fire King pattern, but the broiling burners are of a new pattern, constructed so as to throw down a very intense broiling heat.



New Fire King Broiling Range.

The broiler door is nickel plated all over and has a rubber finished wood handle which remains cool for handling at all times. The top has a nickeled edge and is supplied with two shelves. The range is of handsome design and is substantially constructed throughout.

Combination Hose Reel and Store Truck.

The accompanying engravings show the all iron combined hose reel and store truck which the Crescent Reel Company, Lancaster, Pa., are putting on the market. The article has been designed with a view to meeting the demand of householders, storekeepers and others for a hose reel which should possess the attributes of durability and low cost and be adapted for use as a truck for the conveyance of ash cans, barrels, bales and other loads. Fig. 1 shows the construction of the article. It is of iron throughout ; the handles and sides are made from gas pipe ; the foot is of round iron, the ends entering the piping forming the sides, a frame bolt passes through the foot and sides and secures on the outside a V-shaped axle. The spider or reel revolves on its axle rod, and is provided with four supports for the hose nozzle. The ring seen on one side of the frame is intended to drop over the bracket, thus holding the spider firmly in place. The reel, with hose attached, is easily lifted out of its centers, when the frame proper may be used for purposes of a truck. The makers claim that the device, being made entirely of iron, is durable, and state that the article can be sold at a price low enough to bring it within everybody's reach. The truck is made in two styles and four sizes, weighing 20



Fig. 1.—Truck and Reel Combined.

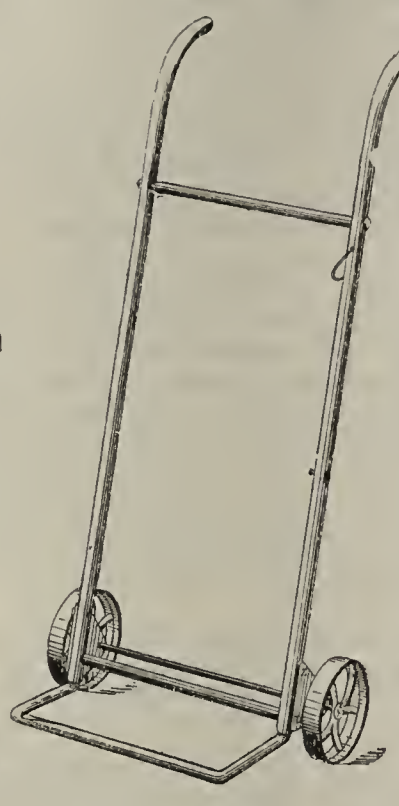
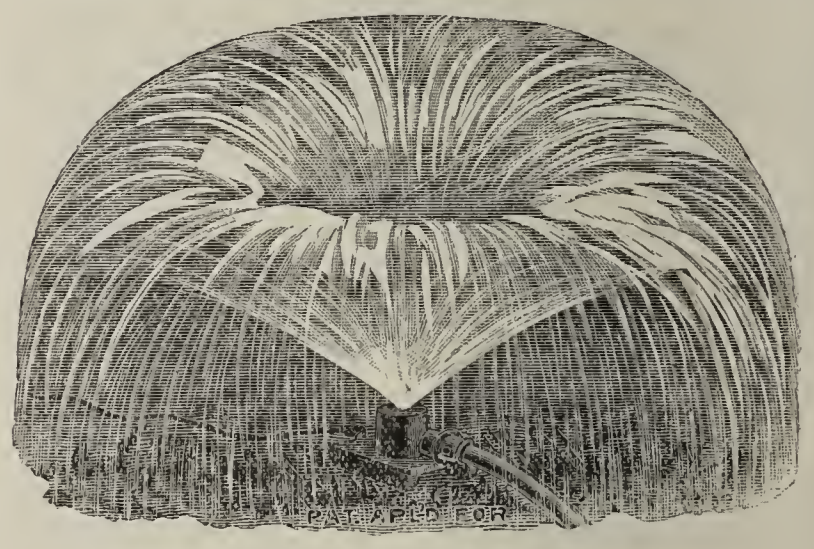


Fig. 2.—Truck without Reel.

pounds and 30 pounds each, and it can be shipped to any point without any risk of breakage in transportation.

Sensible Lawn Sprinkler.

The accompanying engraving shows the Sensible lawn sprinkler, which is just being placed on the market by John C. Kupferle, St. Louis. This sprinkler is made of iron in one piece fitted for ¾-inch hose, and is referred to by the manufacturers as having large openings, with no revolving parts for gritty substances to find a lodging place, and that it is constructed so as to throw a beautiful



Sensible Lawn Sprinkler

spray covering a space of ground from 30 to 40 feet. It is made with low runners, which enable the operator to draw it around the lawn as desired, the runners being low to prevent any possibility of the sprinkler being turned over when being drawn from place to place.

A fire, which supposedly was started in the plumbing department of J. M Ives & Co., dealers in Hardware and House Furnishing Goods, Danbury, Conn., on February 18, did about $10,000 damage to the company's stock and $5000 to the building. The loss is reported as having been covered by insurance.

Fred. Fulmer, dealer in Stoves and Tinware, Newport, Ky., has gone out of business.

NORTH DAKOTA RETAIL HARDWARE ASSOCIATION.

The second annual meeting of the North Dakota Retail Hardware Association was held in Fargo on the 16th inst. Nearly 70 firms were represented. The local committee made admirable arrangements for the accommodation of the guests. President Clark W. Kelly of Devil's Lake, after calling the convention to order introduced Mayor Johnson, who gave the delegates a hearty welcome to the city of Fargo. President Kelly then delivered his address, which was as follows :

President Kelly's Address.

At annual meetings it is customary and it is expected that the president make a report of what has been accomplished and the progress made since the last meeting.

Most of our time has been devoted to the increase of membership, and while the expectations have not been realized, a report is to be given showing nearly 100 members, including most of the strongest dealers in the State. I feel confident that if outside dealers could know of the derived benefits in other States, and what we are determined to accomplish in this, they would join at once.

A meeting of the Executive Board was held on February 2 and took action on an invitation from the Minnesota Association requesting the presence of three delegates at their annual meeting, the delegates to confer with a similar number from Wisconsin and Minnesota regarding the formation of a Northwestern Association. The committee selected as such a delegation C. N. Barnes, H. Harrington and your president. The delegation received a hearty welcome from the Minnesota Association.

Soon after our organization last October our secretary wrote to the jobbers and manufacturers who solicit trade in this State, inclosing a copy of the by-laws and resolutions, requesting a favorable or unfavorable reply to our association. He also stated that if no reply was received it would be understood as being unfavorable. With but few exceptions the replies were favorable. I think there were but three who ignored us. After comparing our success with the delegates from Wisconsin and Minnesota, it was found that a number of the firms favorable to us were unfavorable to them and some of those unfavorable to us were favorable to them. So, realizing how much was to be accomplished by the three States working in unison, we decided to organize a Northwestern Retail Hardware Association, subject to the approval of the three State organizations.

At the Minneapolis convention the delegates from Minnesota were empowered to act.

This association will consist of the presidents of the respective State associations, who are to act as a board to settle all questions referred to them by the different Executive Committees. The Minnesota secretary will send out lists and the cost of the same will be divided pro rata.

To our secretary much credit is due for the excellent work he has done. The work to increase our membership should be pushed by every member until every dealer in the State is with us. We must have strength to accomplish our object, and numbers means strength. With more individual work we will gain our point. Let us all pull together.

Report of Secretary Barnes.

The report of C. N. Barnes of Grand Forks, the secretary, followed, reference being made to many of the matters mentioned in the report of the president. In addition Mr. Barnes said :

During the four months of our organization we have added to our membership over 60 members, but it has mostly been done by correspondence and the good words spoken of our association by some of the traveling men who are with us. I am proud to be able to say that at the present time the North Dakota Retail Hardware Association has the largest number of members in its organization in proportion to the number of available dealers in the State of any similar State Hardware Association. This membership covers every part of the State, and we have members from every county where there is a Hardware dealer, except in three instances.

For further information I will say that according to the best and most reliable list I am able to secure, there are about 190 legitimate Hardware dealers in the State, 44 in towns of 1000 and over, 54 in towns of 700 and over, 65 in towns of 500 and over, leaving 125 in towns of less than 500 population.

The report of the treasurer showed that there was money on hand, and owing to the fact that the hardest part of the organization work had been done, it was pointed out that the expenses would grow smaller, rather than larger, and a resolution was adopted making the dues on the following schedule : $3000 or less, $4 a year ; $3000 to $5000, $5 per year ; $5000 and over, $6 per year.

The first matter taken up after the noon recess was the election of officers. Clark W. Kelly was nominated for re-election as president and received a unanimous vote.

C. F. Jacobs of Hillsboro was nominated for re election as vice president, and received a unanimous vote, and the following Executive Committee were also elected : W. R. McIntosh, Bottineau ; H. Harrington, Fargo ; J. F. Newgaard, Grafton ; H. B. Allen, Jamestown ; O. A. Gallup, Edgeley ; A. J. Smith, Fesenden; W. H. Pinkerton, Lakota, and the president and vice-president.

In executive session the matter of a Northwestern Association was discussed at considerable length, and the result was the passage of a resolution providing for the organization of a Northwestern Retail Hardware Association composed of the States of Wisconsin, Minnesota and North Dakota: that the association shall be represented in executive session by the president or any member of the local association that the president may appoint, and that the rulings emanating from this Executive Board will become effective in the States forming the association.

It also provides that the members of this association confine the purchase of Hardware, Stoves and Tinware to manufacturers and wholesale dealers who sell goods only to firms that are regularly engaged in the retail Hardware business. Retail Hardware dealers are described in the resolution to mean any person having an established place of business and carrying a line of Hardware, Stoves and Tinware and such other goods as are usually kept in a first-class Hardware store, and in all cities of less than 5000 population all persons carrying a complete line of Hardware in connection with any other kind of merchandise.

The resolution also provides for the keeping of a record of all jobbers or others who sell goods to other dealers than those described in the resolution as retail Hardware merchants. It also provides for taking such action as may be deemed necessary to enforce the provisions of the resolutions, ending with the claim that the measures are just and necessary for their welfare and a rigid enforcement is demanded.

Several interesting papers were read. Among those prepared was one by A. H. Duntley of Grandin, favoring the formation of the Northwestern Association, and another by L. P. Strong of Neche on the subject of The Importance of Small Things. H. F. Strehlow of Casselton also prepared a paper on What Are the Benefits of this Association to Us.

The Executive Committee held a meeting after the papers had been disposed of, and C. N. Barnes was re-elected secretary. H. N. Joy was chosen as treasurer. About 20 of the members from the western part of the State were unable to reach Fargo before 6 o'clock in the afternoon, owing to delayed trains, and they indulged in an informal meeting the evening after the convention had been adjourned. Matters of interest to all were discussed openly, and the evening session proved a profitable one.

SPRING TRADE.

BY BASKET GRATE.

It was in a good old country town with a right smart sprinkling of Quakers among the horny handed old farmers that I got my first experience in the stove business. After stock taking in January, which we soon completed, I worked in the shop or clerked in the store if the boss went around neighboring a little. We made ware and did all sorts of tin and sheet iron work, set furnaces, sold stoves, hardware and all kinds of house furnishing goods. I had been through one fall season when the spring of 1875 was looked forward to and this experience enabled me to escape doing more than my share in the preparations that were made for it. In our section moving day came on March 25, and in February we blacked up our stock and filled up the sample row mostly with big flat top cook stoves, just such as the farmers wanted. We cleaned up the tinware and brought in new stock from the storeroom and got ready for the " movers " and " begin-

ners." There wasn't so much fun selling the "movers" who had concluded that their old stove wasn't worth moving from one farm to another; they dealt too close. But the "beginners" had to stand a lot of chaff. Our store had been established somewhere about 1825, and the course of treatment for "beginners" had been improved as it had been handed down from time to time, and I received my preparation from a fellow who had got a better job than lifting stoves, though in his day he had been "the best in town."

When "him" and "her" made their appearance with the old folks and announced that he had taken the "Spung farm" on "shears," and that they, the "beginners," had just been "spliced" and were "pricin'" an "outfit," we received them with a cordiality that was warm enough to bake with one joint of pipe. Of course, the cook stove came first, and they looked at a No. 7, but we suggested that crops weren't the only thing to look forward to and a No. 8 would be handy in a few seasons. The old man would laugh, and his wife would busy herself feeling to see if there was good iron in the oven plate, while he scowled and she looked as becomes a modest woman. After dickering as to how many pots and pans went with the stove and settling that, we would throw in a Sunday tea pot for the bride. Then the dish pan and other kitchen tinware which we assured them was absolutely necessary was all brought out and as much crowded on as possible.

Then came the knives and forks and spoons, &c., and then the clothes wringer, washtubs and wooden ware, with many suggestions that were received with varying expressions. While this line was being selected the old man might grow weary and draw up to our stove, and if an old, seldom seen acquaintance dropped in the old man would be asked if it was "off" or "on"—"off" meaning that the "gal" had done well and would be no more expense, while "on" meant that he reckoned on having two to keep, this conversation being in tones that might be "heard at the barn." The old folks if they were "setting the gal up" wouldn't want to appear mean, and if they were good pay we would see to it that she had a good outfit. Then he wouldn't want to appear mean when we went at him for pitchforks and other barn tools, and she would say good tools made work easy, and as she had everything to make work light she didn't want him to be killed by having to work hard with cheap things. When we got through we promised to mend all the tinware the first year free and made ourselves solid with her, even if she did make the "jour" mad by taking a stamped dish pan instead of one of our own make.

Then to wind up, we said the old folks ought to make them a present of a parlor stove, and if we could work it they got one that heated upstairs by a register in the floor, for it was suggested that a warm bedroom was handy when any of the family was sick in the winter. If it all went through as nice as I have told it, we would clinch their future trade by throwing in a wood grate, so they wouldn't have to burn coal in the summer to heat up the house, for this always tickled "her" and had a good effect on "him." Well, I hain't sold an outfit for many a year, but I'm told by them that do that it can't be done in the spring to any extent nowadays, and the sort of spring trade I've been talking about has been knocked out by gasoline and blue flame oil stoves.

MEMORANDA.

The McKee & Campbell Company, Chattanooga, Tenn., will in a short time move to a larger building, where they intend to put in a wholesale and retail Crockery, Glassware and House Furnishing department.

Scott & Forsee, dealers in Hardware and Stoves, Eminence, Ky., have been succeeded by E. F. Forsee.

L. R. Brickenstein has succeeded to the retail Stove business hitherto conducted by Senseman & Brickenstein, at Salem, N. C.

The fame of the Rochester Silver Nickeled Ware, made by the Rochester Stamping Works, Rochester, N. Y., is not confined alone to the United States, where it is so extensively used, but has spread to many foreign countries, and there is hardly a place in the civilized world where it has not found its way. For High Grade Nickel Plated and Copper Ware this product of the Rochester Stamping Works has secured an enviable reputation. Those who care to know more particularly what goods are made in this ware and what they look like can satisfy their curiosity by writing to the Rochester Stamping Works for one of their catalogues and price lists.

The C. H. Gagen Roofing Company, who are now located at 189 West Tenth street, New York City, will be glad to receive catalogues and price-lists from manufacturers of Hardware, Tinware and House Furnishing Goods. They will also appreciate the receipt of samples and prices of roofing materials.

H. B. Rusler, Johnstown, Ohio, will be glad to send to any one applying for it a catalogue relating to the Comet Sprayer, which in addition to a Fruit Tree Sprayer is a Lawn and Garden Force Pump. The catalogue likewise gives hints on spraying.

The Excelsior Steel Furnace Company of 38 West Monroe street, Chicago, have just issued a new price list of their Furnace Fittings, showing some changes in sizes and also in the construction of this line of goods for '98. The shape and size of the inside pipes of their Double Safety Wall Pipe have been altered so as to make the air spaces between the inner and outer pipes uniform, and also to admit of the use of a new and improved separator. The new separator is claimed to possess great strength, and stress is also laid on the fact that the ventilation in the Excelsior double piping is into the partitions and not into the living rooms. The price list on both double and single Wall Pipe and on double and single Boots or Foot Pieces has been reduced. Copies of the new list will be mailed to the trade about March 15.

C. Sidney Shepard & Co., 23 and 25 Randolph street, Chicago, have made an improvement in their Steaming Pans used in connection with Buffalo Egg Poachers, which will be greatly appreciated by those who use them. The size of the Pans has been increased by making the steaming ring narrower. The same effect is obtained, but the capacity of the Pan is considerably increased, enabling a larger quantity of cereals or other food to be cooked at one time. They have brought out a new Chafing Dish, which they expect to prove a desirable size.

Hibbard, Spencer, Bartlett & Co., Chicago, have added materially to the capacity of their great establishment on the corner of Wabash avenue and Lake street, by securing the last store building in the block on Lake street. The lease of the present tenant expires May 1, but they hope to be in possession before that date, when they will enjoy the ownership of a solid block, running from Nos. 16 to 32, bounded by Lake street on the south, Wabash avenue on the west and wide alleys on the north and east. They have long had this enlargement in view, but circumstances have not been entirely favorable for its consummation until now.

The store of H. B. Webber & Co., Ionia, Mich., was completely destroyed by fire a short time ago. The firm will resume business as soon as a new building can be erected on the old location. The house carried on both a wholesale and retail business in Hardware, Stoves, Tinware, Sporting Goods, &c.

Joseph Simmons has withdrawn from the E. L. Wilson Hardware Company, Beaumont, Texas, and opened up on his own account under the style of Simmons Hardware & Mill Supply Company, handling Hardware, Stoves and Tinware, Agricultural Implements, Sporting and Athletic Goods, Paints, Oils, Bicycle Sundries, &c.

Henry E. Kemp Hardware Company, Phœnix, Ariz., have been incorporated, They are doing a wholesale and retail business in Hardware, Stoves, Tinware, Implements, &c. They have lately taken possession of new quarters on Washington street.

At the regular annual meeting of the stockholders of the Barlow Hardware Company, Corry, Pa., on the 7th inst., the following officers were elected for the ensuing year: Will E. Steele, president; G. H. Barlow, secretary; James L. West, treasurer, and R. J. Follett, vice-president. The company are jobbers and retailers of Hardware, Mill, Plumbing and Lumbermen's Supplies, Bicycles, &c.

The Cuprigraph Company, 108 North Green street, Chicago, are sole manufacturers of a water distilling apparatus which they style the Sanitary still. It has been designed to meet the growing demand for a method of securing absolutely pure water in every household. This is secured by distillation. The apparatus commonly employed, however, is cumbrous and not well adapted for household use. The Sanitary still can be used on gas or gasoline, oil, coal or wood stoves, and not only distills water but aerates it at the same time, thus producing a much more palatable beverage than if not aerated. Various sizes are made to suit different requirements.

STOVE TRADE NOTES.

SHORTS.—I.

BY THOS. F. KENNEDY.

In stove foundries the term shorts is applied to pieces that are wanting to complete a stove or batch of stoves. They may be only a few pieces, or they may be the greater part of a stove, the latter being often the case when a stove is being evened up just previous to going out at the end of a season. To the conscientious foreman or superintendent of a stove foundry shorts are the bane of life. To the piece workers, molders and mounters they are a great annoyance and cause of loss of time, which to them means money. They also often cause delay at critical moments. But it is the man or men who foot the bills on whom the greatest loss falls.

The actual loss from this cause is never known exactly, and in the majority of foundries it is not known even approximately. From 1 to 3 per cent. is added to the piece price as an allowance for breakage. But I have known cases where 10 per cent. of the molding price would not cover the cost of molding shorts, not to mention the loss and annoyance they cause in other directions. From the first day a stove goes in the sand there are two forces at work making shorts, for every casting must run the gauntlet of loss by the molder and breakage after leaving the molding room. As no two pieces go any length of time with the same amount of loss from these causes we soon have shorts. To these may be added the demand for certain pieces for repairs after the stove has been on the market awhile, and when there are several pieces of different kinds on one follow board, if one is a little more difficult to cope than the others, and the molder gets an imperfect lift on it, as the lesser of two evils he lets it go by the board and finishes the mold without it. He loses, of course, but he reasons that he would lose more by stopping to make another cope.

In the mounting department a short is a short, but the man whose duty it is to go on the molding floors and have them made knows that there are shorts and shorts. He knows, if he has ever given the matter a thought, that while shorts may be the same always and everywhere, he has to deal with them under several widely varying conditions. First : Pieces made one on a board or two of the same kind on a board. The treatment of these is simple and obvious. If they are short and must be evened up, it means more flasks. When only straight bar flasks are required the only loss that occurs is the molding price of pieces that have been broken after leaving the molder's hands. Shorts in this class from the other causes mentioned entail no loss, except the infinitesimal amount lost in remelting pieces that have been lost by the molder. A piece that is short from being left out may cause delay and inconvenience, but no direct loss. If a piece in this class requiring a cut flask is short and must be evened up, the making of a flask is a matter of some expense unless, as often happens, the stove is only running four or six a day and there are eight or ten sets of flasks, or when only one or two pieces extra are needed, and where the heat is long enough it is a common practice to cast one of the molds early in the heat and use the flask to make another mold, which can be cast later in the heat. This is called "molding over," and can hardly be done in small foundries where the heat is short.

Next come the small pieces boarded with larger ones in waste spaces on the board, commonly called deadheads. When one of these is short and must be made extra it may be given to the day hand, if one is employed, who makes it without a board in a small flask. If the piece worker whose job it is makes it in a small flask without a board, he expects and gets from 10 to 200 per cent. more than the piece price for it, the custom differing in different shops and often in the same shop varying with the mood or conscience of the man who sets the price or the conscience and nerve of the man who asks the price. Often even when the molder gets the outside figure he does not make as much as he would in the regular course. The snap flask is very convenient for such of this work as can be made in it. An expert snap molder will make a temporary board out of new sand in about ten minutes, which will last several days and can be used to make as much as 100 molds. He will expect and is entitled to something for making the "match," and from 10 to 25 per cent. more than the board price for each piece, the amount varying with the nature of the work. All of this class of shorts cost more than the board price to get them made up, no matter how lost, whether broken, left out or lost by the molder. Managers of foundries who were so disposed could during the last few years dictate the terms of settlement for evening up work, and it is to their credit that no harsh measures have been adopted.

Then comes the work made in snap flasks. The man with the short list, approaching the first bench molder, may be heard to say something like this: "No. 1, make four extra of your name plates to day." Passing on to the next : "No. 2, those doors you are making are away behind; make 25 extra at the rate of five a day," and so on down the line of snap molders, or he can use his chalk and never say a word. I have noticed that "sure to-day," marked in chalk on a follow board, never fails, as it cannot well be forgotten. Whatever way he goes about it, it will not take as long as the telling, and he needs no corps of flask carriers to aid him. Shorts of work made in snap flasks cause but little delay or inconvenience to any one, and the only direct loss is on broken ones.

The last and most difficult of all shorts to deal with are those where two or more patterns of different kinds are made on one board. When a piece on one of these boards is short the first thing that must be done is to examine the board to see whether it can be used to make the piece in a small flask; if it can the flask carrier comes around and takes the measure and hands up a flask that will make it. If the piece worker makes the piece and only gets the piece price for it, he is certain to lose on it. It often happens that a short piece cannot be molded except in a flask made for a board on which there may be several pieces, and up to the time the depression set in it was the custom to pay a piece worker for the whole board when he made even one piece in the flask that belonged to the board. Long after the last stove has been made from a set of patterns the demand for certain pieces for repairs continues, and I have known cases where it was more convenient to make a piece without any board than to use the one on which it had been made.

Shorts are inevitable under the prevailing piece price system, but it is possible to remove the cause of some, and at the same time modify the conditions that make it difficult and expensive to deal with them. The means employed to do this would be mutually advantageous to molder and manager, as I shall try to make plain in the next chapter.

Rathbone, Sard & Co., Albany, N. Y., received a letter from the West lately asking them if they had some printed directions for operating the Good Samaritan Cook Stove made in 1859, as there was no one there who seemed to understand operating it properly. It would seem from this that the manufacturers of Acorn Stoves made them so well in the '50's that even now they are in use. They

also received a letter from the South asking for some castings for the Good Samaritan, the writer stating that she was delighted with the Stove as a baker and therefore hated to part with it, unless she could not get a top to fit the Stove.

The Stove Trade in Maine.

In an interview with the representative of a Portland, Maine, paper the manager of the Portland Stove Company is reported to have expressed himself as follows regarding the stove situation in that State:

"I consider the outlook better than it has been in the last five years. Sales are more numerous and collections better than they have been of late."

"In your opinion is Maine going to be able to hold its own in the stove making industry in competition with other States?"

"I don't know why not. Maine can hold her own in most anything. Her people, as a rule, are loyal, and the cost of manufacturing in this State is as low as anywhere in New England. Here in Portland we have, perhaps, a little advantage over inland cities in the matter of freights, our iron and coal coming to us by water and being landed at our very doors. So far as I know, the two stove foundries at Bangor and the one at Waterville have been doing well, and it seems to me the plant in Auburn ought to be made to pay. The stove business is not what it used to be, for Western competition has increased to the extent of cutting down the profits. We aim to conduct our business as economically as possible and to sell nothing at less than the cost of manufacturing. There are innumerable details that need careful supervision. Too much attention cannot be given to the little things pertaining to the business. The time was when it was thought that Maine could not compete with some other States in stove making, but that time has long since gone by. Maine is an excellent field for the sale of its own products. We try to cover it thoroughly, and we have met with a considerable degree of success. We send agents into New Hampshire, Massachusetts, Vermont, Connecticut, and have just begun to work the Rhode Island field a little."

"Have you been forced to curtail of late in the number of your employees?" was asked.

"No; we have been running our regular crew of about 75, and so far as we can now foresee there will be no occasion for curtailment this year."

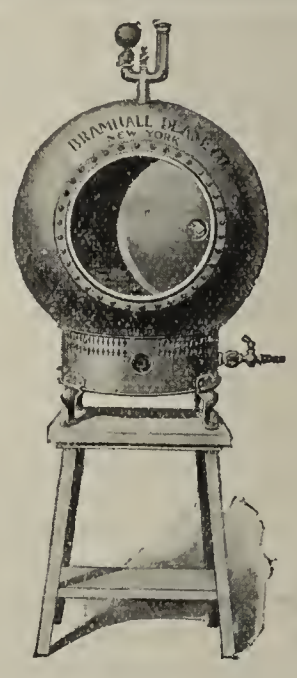
Monarch Stoves and Ovens.

A copy of a handsome illustrated catalogue of Monarch stoves and ovens for gasoline, gas and oil reaches us this week from the Monarch Stove & Mfg. Company of Mansfield, Ohio. The volume consists of 88 pages, is printed in colors upon a good quality of paper, and is bound in lithographed covers, on the last page of which is illustrated the progress which has been made in cooking since the sixteenth century. The first picture represents a scene in a forest, where by means of an open fire an Indian is cooking his evening meal. The next shows the open fire place and the manner in which it was used for cooking purposes. The next shows the early cook stove when wood was the universal fuel, following which comes the coal range, and finally the Monarch Process stove of the present day. In the make up of the catalogue the illustrations appear for the most part upon the right hand pages, with brief descriptive text on the facing pages. In the upper left hand corner of each descriptive page is a corner piece consisting of a picture of the Monarch Process stove. In referring to the Monarch line the manufacturers state that "it enters its eighteenth year of public service with a positive assurance that it has reached the high water mark of progressive development." The company state that they have made it their constant aim to incorporate into every pattern they make "some original feature that will afford the pushing and live merchant an opportunity to build up a reputation for high class goods and to reap a profitable trade from their sale." The leading place in the volume is given to the Monarch New Method, which is shown in several varieties, after which we find the Regal Monarch double oven cabinet range, accompanied by illustrations of the smokeless lighting device and subheating flame for single generator, these in turn being followed by the Monarch with stationary oven and broiler. The Monarch No. 24, with new Giant smokeless generator, is next in order, after which are shown a number of styles of the Monarch with elevated tank. The Monarch blue flame oil stoves occupy a section of the catalogue, after which come the Monarch blue flame heaters, the Monarch sheet flue ovens, the Royal Monarch gas range, Monarch hot plates, gas heaters with asbestos back wall for natural or artificial gas, Monarch gas instantaneous circulating water heater, Monarch gas burners, &c.

At a meeting of the Reading Stove Works, Reading, Pa., on February 18, a dividend of 10 per cent. was declared.

Deane's Eclipse Sterilizer.

In the accompanying illustration we show Deane's Eclipse sterilizer, made by the Bramhall-Deane Company, 264 Water street, New York City, which has been primarily designed for the use of physicians, dentists and such professional men as desire to sterilize their instruments, bandages and other articles used by them. It consists, as may be seen, of a wrought iron table supporting a copper globe. A large circular opening is provided in the front, through which water may be supplied for the generation of steam by means of a gas burner beneath. Racks are provided for supporting the articles to be sterilized. At the top of the globe is a fitting to receive a specially constructed thermometer, which shows both the temperature and the pressure of the steam, and a safety valve, which is so constructed as to overcome all liability of sticking in its seat and failing to open under undue pressure. The attractive feature of the sterilizer is the workmanship and the method of sealing the front opening. The face of the circular door shown in the engraving is ground to fit the inner surface of the door frame. As soon as the door is closed the steam is generated, the slightest pressure effectually sealing the door against leakage and prevents its being opened until the steam



Deane's Eclipse Sterilizer.

pressure has ceased. The large surface presented by the door effects a pressure against the seat so great that even under 1 pound pressure it is almost impossible to open the door. The company also manufacture a varied line of cooking apparatus, and heating and drying apparatus adapted not only for hospital use but also for hotels and restaurants.

Water of Combustion from Gas Stoves.

The well-known English manufacturer of gas stoves, Thomas Fletcher of Warrington, sends the following entertaining and also instructive letter to the *Gas World*:

The faults which have been claimed for this (the flueless gas stove) are numerous. The last new fault has been discovered by an "expert" and architect, who has been called in to certify that the dampness of a house is caused by the water of combustion evolved by a flueless gas stove. If an expert cannot prove, beyond question, anything he is paid to prove, he is certainly not an expert. The amount of gas used for warming a room is about the same as would be required to light it if the burners were placed in a proper position; and, if the expert's opinion is correct, the use of gas for lighting should also be discontinued, although flueless gas stoves have been in use for years to keep large organs dry in public buildings. One curious thing in connection with this is that the amount of moisture formed by a gas burner consuming 4 cubic feet per hour is precisely the same as that given off by the lungs and skin of an average healthy person—*i.e.*, 60 ounces, or 3 pints, in 24 hours. If this expert is correct as regards the cause of dampness in a house, how much greater the trouble must be with the large amount of moisture exhaled by the residents in the house. Figures can be made to prove anything. An average healthy person, if in bed for eight hours, will lose 1 pint, or 20 ounces, of water through the skin and lungs. One pint of water in bed every night ought to be a serious matter, and yet we survive, and our lives are longer than those of our ancestors, spite of microbes, flueless gas stoves and beds which ought to be damp. The expert will, perhaps, try to prove next that sleeping in bed is the reason why so many people die there. Perhaps we shall have this question raised in the newspapers during the next Parliamentary recess.

ODD PLATES.

At the South Presbyterian Church, at Galena, Ill., there was recently given by the Ladies' Aid Society a magazine entertainment, which proved to be a very novel and unique divertisement. The programmes took the form of the cover of a miniature magazine and were furnished gratuitously to the ladies by A. W. Glessner, president of the Excelsior Steel Furnace Company of Galena and Chicago, and were printed on a new press especially intended for fine color work.

Cribben, Sexton & Co., manufacturers of Universal Stoves and Ranges, Chicago, will shortly convert their firm into a corporation, under the name of Cribben & Sexton Company, with a capital stock of $300,000. Although Col. James A. Sexton has retired from the firm, as stated last week, the old name will be practically retained, as it has been so long known in the Stove trade that it undoubtedly has a commercial value.

John Demarest, well known in the New England heating trade, has arranged to represent the Craig-Reynolds Foundry Company of Dayton, Ohio, in the New England States, and will establish his headquarters at 165 and 167 Fort Hill square, Boston, where a complete line of Triumph Warm Air Furnaces, Steam and Combination Heaters, Hot Water Boilers and the Triumph Acetylene Gas Machines will be carried in stock. Mr. Demarest will look after the interests of the Craig-Reynolds Foundry Company in all parts of New England, and will carry stock in Boston for distribution to the trade at short notice.

The Excelsior Stove & Repair Mfg. Company of Quincy, Ill., have found it necessary, owing to the expansion of their business, to again increase their facilities. They have purchased the entire plant and machinery of the Bonnet-Nance Stove Company, which was partially destroyed by fire in November last. The work of rebuilding has already commenced and it is expected will be completed within 90 days, the structures now under way being much larger than those destroyed. The company are getting out patterns for many new lines of goods which they expect to show the trade in the near future.

Isaac A. Sheppard & Co. of Philadelphia, Pa., continue favoring their friends in the trade with cards of various sizes and shapes calling attention to some of the good things which they are prepared to furnish in the way of heating apparatus. The cards are cleverly illustrated, while the text calls attention to the merit of Paragon Furnaces and Excelsior Ranges. In this connection they direct attention to their little book, entitled "Hints About Heating," which was written to show how the Paragon Furnace operates "in the correct, logical, satisfactory way for heating a house." While it was written for that purpose alone, it contains tables, diagrams, &c., which they say ought to interest every architect and builder. A new edition, revised and enlarged, has been issued and a copy will be forwarded free to any architect.

We have received with the compliments of W. H. Colebrook & Co., Syracuse, N. Y., a steel plate portrait of George Washington, accompanied by a neatly printed leaflet, the top border of which carries a design made up of clusters of cherries and a hatchet which has evidently seen hard service. In referring to the "Father of his country," the company state that although glowing tributes have been paid to his many virtues by great and good men the world over, none is better known than "he could not tell a lie." The company also make the point that while in some of his best qualities Washington was superior to them, they claim in one respect to be his equal, in that they cannot tell a lie when they say their goods are the best and their prices are the lowest on their Asbestos Furnace Cement and Indestructible Stove Putty.

Advance sheets have reached *The Metal Worker* of an unpretentious little work on heating which the Excelsior Steel Furnace Company of Chicago are printing at their Galena publishing house. It is designed to be placed in the hands of intending house owners by the agents of the Excelsior Steel Furnaces, and tell the "Facts Not Fancies" about heating, presenting the subject in an attractive manner which can hardly fail to interest the reader. The treatise is printed on white paper in two colors of ink, and when the 72 pages are completed the work will be handsomely bound in crimson raw silk and will be fine enough for "my lady's" dressing table.

We are indebted to the Stamford Foundry Company of Stamford, Conn., for a photograph of a new six-hole Range which has just been placed upon the market and for which the manufacturers are beginning to fill orders. The Range is known as the Stamford and presents a very attractive and substantial appearance. It is embellished for the most part with cast ornamentation, this being relieved by an odd shaped nickeled name plate on the oven door. In this panel is an oven thermometer, so that the temperature of the oven may be noted at a glance. The photograph shows the Range with end shelf, pedal oven door opener and ornamental skirt. The general design of the Range is of a character well calculated to attract the attention of dealers, and we have no doubt this latest production of the company will meet with a wide popularity.

Announcement is made by John Sweeney that he has sold his entire Stove Board business to Cooper & McKee, Brooklyn, N. Y., the well-known manufacturers of Refrigerators. Mr. Sweeney bespeaks the confidence and patronage of the trade for the new concern who have taken over his Stove Board business.

According to Southern advices the interests of C. W. and A. L. Adams in the corporation of Bridgeford & Co., Louisville, Ky., were purchased on February 15 by P. Galt Miller, formerly vice-president of the concern, and George Ogle, who has been connected with the business for 38 years and for some time past has been superintendent of the tin department. The corporation will be continued under the old name of Bridgeford & Co., Mrs. W. L. Bridgeford retaining her interest. We understand it is the intention of the new owners to keep the plant in Louisville, but new quarters for the foundry will be purchased, as the old building and ground have been secured by the Illinois Central Railway Company. The new owners will make arrangements to run the various departments full capacity. A. B. W. Allen, who has been connected with the company for 35 years, will have charge of the office. Mr. Miller, who until ten months ago was vice-president of the corporation, began his connection with it when 16 years old and remained 44 years. We understand that the purchasers of the Adams' interests have ample capital back of them to push the business, and that their purchase included all merchandise, tools, patterns, good will, &c.

The Western Hardware & Mfg. Company of Milwaukee, Wis., are about erecting an extensive plant in that city on the south side of the tracks of the Chicago, Milwaukee & St. Paul Railway Company, and will move from their present quarters on Third street about May 1. The new site consists of 7 acres and the factory is to cost, we understand, $75,000. There will be a foundry 50 x 150 feet in size, a manufacturing building 150 x 300 feet and four stories high; enameling and japanning department. 75 x 150 feet, two stories in hight; a store house, 100 x 200 feet and three stories high; engine and boiler house, offices, stables, &c. The company now employ from 125 to 150 hands, but in the new quarters they expect to employ from 300 to 400 in the manufacture of Oil, Gas and Gasoline Stoves and Hardware Specialties.

Leonard Fingal, 692 North Irving avenue, Chicago, Ill., has been granted a patent on a press to be run by power for packing the sand in a flask in making molds for foundry purposes, instead of the present method of ramming sand by hand. The apparatus is said to be particularly adapted for the higher class of iron casting, especially stove plate and similar work. The object of the inventor was to furnish a machine that would give the same results as ramming by hand, the best feature claimed for it being that the pressure is from above in a flask with the sand below, thus allowing the pattern to be withdrawn from the sand in the ordinary manner. The patentee points out that in stove plate work the pattern can be returned by printing back in the mold to good advantage.

The McClary Mfg. Company's Benefit Society of London, Ontario, held their annual concert in the local opera house on the evening of Friday, February 18, which brought out a large attendance. The programme was varied in its character, including vocal and instrumental music, readings, dumb bell drill, &c. We understand that the receipts of the benefit society during 1897 were $2144 and that over $1200 were paid out in sick benefits.

The Excelsior Stove & Repair Mfg. Company, Quincy, Ill., have certified to an increase in capital stock from $21,000 to $60,000.

The Kernan Furnace Company report that their Furnaces have been used successfully for heating the school at Philadelphia, N. Y., and the First M. E. Church at Bovina Centre, N. Y.

The Victor Stove Company of Salem, Ohio, announce that Mr. Myers of Philadelphia, Pa., is representing them this year as salesman in the State of Indiana and is now calling on the trade. They suggest to dealers that orders be reserved until he calls, as they are out with a new line of Oak Stoves which are up to date in all respects, having jointless base, being well mounted, attractively nickeled and offered at a low price.

A plan of making the smoke of a Stove pass between two concentric tubes, so that it heats the air in the inner tube before it itself goes away up the chimney, is, says a foreign exchange, coming considerably into use in Russia The inner tube is open at both ends, so that the air heated within it passes in a rapid current into the room.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Notwithstanding large arrivals and an almost total absence of speculation, the market has held up remarkably well. There has been a very good business with consumers and the interior jobbing trade, and the fact that the firmness of the market is due wholly to the large consumption is taken as an encouraging sign. Jobbers' prices for small lots of Straits Pig from store are firmly held at 14½c. to 15c. per lb., according to size of order.

Copper.—Between quite heavy exports and liberal deliveries to home consumers there is a movement that absorbs about all of the current production and keeps the market in strong position. No new business of unusual character is taking place, but a considerable amount of the metal is involved in present negotiations, and the situation is such that holders are quite generally asking higher prices. Dealers' quotations for small lots from stock are firmer, at 12½c. per lb. for Lake Ingot and 11½c. for Ansonia Grade Casting Copper.

Sheet Copper.—In sympathy with the advance in raw Copper, greater firmness is noted in all lines of manufactured Copper, including Sheet, which is now generally quoted in retail lots at 15c. per lb., basis. Increased inquiry and an outlook which promises a heavy consumption have encouraged the manufacturers and the radical cutting of prices which has prevailed for some time past is less in evidence, although prices are not yet uniform. There is some talk of a renewal of the agreement among the makers of Sheet Copper, but nothing definite in this line appears to have been initiated so far.

Pig Lead.—Dealings have been moderate here and the demand has developed no new activity. For that matter, speculation has been remarkable only in point of inactivity, while large consumers and jobbers have purchased very sparingly. Some improvement is noted in the retail demand, however, and prices are quite steady. Small lots of American Pig from store sell at 4⅛c. to 4¼c. per lb.

St. Louis advices are as follows: There is no change to note in this metal. The demand is improving and the market is being fairly maintained.

Spelter.—There has been merely an ordinary business and no especially lively demand in this quarter. Offerings by smelters are somewhat reserved, however, and the output appears to be well taken care of. Prices are held very steady. Good Western brands in retail quantities are quoted by dealers at about 4½c. per lb.

St. Louis advices are as follows: A better demand is noted for Spelter and consumers are disposed to increase their orders to some extent and not confine their pruchases to their immediate wants as heretofore.

Antimony.—The market has been rather quiet, but prices remain firm, especially for the cheaper kinds, of which stocks are somewhat scanty. In small parcels from store, Japanese is quoted at 7½c. to 7¾c. per lb., Hallett's at 7¾c. to 8c., and Cookson's at 8½c.

Nickel.—Sellers are still quoting 37c. to 38c. for small lots.

Tin Plate.—American Plates remain unsettled in price and rather weak, but show no quotable change. Orders in this vicinity are coming in very slowly and the total volume of business done during the week was of comparatively small proportions. The large consumers still remain indifferent, and the smaller are buying generally in hand to mouth fashion. Uncertainty as to the proposed consolidation of Tin Plate mills has its influence in holding off those large buyers who have not placed their contracts some time back. Many are understood to have done so, but, on the other hand, there are others who are known to be awaiting the outcome of the combination negotiations before placing their orders, and these, it is believed, will require a very large amount of Plates. The canners generally are looking for one of the largest packs this season ever made, and their requirements are likely to make a big hole in the available output of the mills. The Tinware manufacturers also anticipate a heavy business, and it is expected that the demand for Roofing Plates will reach considerably better proportions than last year. Consequently the outlook for a good business in Tin Plates is decidedly favorable. It is the question of prices that is worrying the trade. They are down now as low as they can be to yield a profit, and it seems as though they are so heavily weighted that nothing but an absolute shortage will be forcible enough to hoist them up to a more profitable level. Small lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are quoted about as follows, but there is still a good deal of cutting under these rates: American Coke Tins, IC, 108 lbs., 14 x 20. Bessemer Steel. $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3 30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4 25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are selling very slowly elsewhere than among canners of export goods, and their prices are largely nominal.

Chicago advices are as follows: Manufacturers have recently had a heavy trade. Large contracts for Coke Plates have been entered for canners covering deliveries to July 1 and in some cases through the year. Leading manufacturers are looking for a scarcity in Coke Plates and much higher prices, but others are not so confident, owing to the increased producing capacity which will shortly be available.

Sheet Iron.—Manufacturers' agents report the demand for both Black and Galvanized Sheets is active, buyers placing orders quite liberally, especially for forward delivery. All the mills are busy and many are well booked up for the next three or four months. Prices, while showing no quotable change, are more firm. Jobbers in this quarter report a rather better business. Small lots from stock are quoted at about 2.40c. for No. 27 Common Black Sheets and 80 per cent. off for Galvanized.

Chicago advices are as folows: Continued heavy business is reported in Galvanized Sheets, but not much doing in Black Sheets as far as can be learned. Black Sheets seem to be rather weaker. Jobbers quote small lost from stock at 2.30c. to 2.40c. for Black Sheets and 80 and 2½ to 80 and 5 per cent. off for Galvanized.

Old Metals.—The demand for old metals, both for home consumption and for export, is quite active, and values of Scrap Copper, Brass and Zinc are all somewhat higher for the week. There is a better movement also in Scrap Iron, but while holders are getting more money than was possible two or three weeks ago, prices of this material generally do not vary from former quotations. There has been a slump in the Tin Plate Scrap, the export demand being shut off *pro tem.*, owing to surplus stocks on the other side. Otherwise the market for old metals, as a whole, is decidedy stronger. Yard dealers in this city and vicinity are paying about the following rates for moderate sized lots, delivered here:

Heavy Copper	per lb.	9⅝c.
Light and Tinned Copper	per lb.	9 c.
Heavy Brass	per lb.	6⅜c.
Light Brass	per lb.	5⅜c.
Lead	per lb.	3⅜c.
Tea Lead	per lb.	3⅛c.
Zinc	per lb.	3 c.
No. 1 Pewter	per lb.	8 c.
No. 2 Pewter	per lb.	4½c.
Wrought Scrap Iron, per gross ton		$8 25
Heavy Cast Scrap, per gross ton		8.25
Stove Plate Scrap, per gross ton		5.75
Burnt Iron, per gross ton		4.25
Tin Plate Scrap, per ton		2.75

THE IRON MARKET.

The business community generally suspends judgment relative to the "Maine" disaster, but at the same time the more prudent are moving cautiously so far as any new ventures are concerned. It is stated, for instance, that the bankers who are to underwrite the Wire consolidation are now of the opinion that the near future may not be a particularly auspicious time for launching the new company. Until recently everything connected with the scheme progressed very favorably, but quite recently a hitch has come up which may prove troublesome. A meeting is called in New York for the 28th inst.

The Alabama furnace interests are still conferring. It is understood that a pooling arrangement had been practically perfected when the decision in the Cast Iron Pipe Trust case was announced. That put an end to efforts in that line, and since then other methods for getting on a remunerative basis have been under consideration. In the meantime prices continue low, with indications that

at least one company are determined to get additional business.

There has been quite a fair movement of Bessemer Pig in Pittsburgh, our correspondent reporting sales aggregating 30,000 tons at $9.60 to $9.75, Valley furnace.

Steel Billets are very quiet, but a large tonnage has been placed in Sheet Bars, including one very large deal. The quotation is $17 at maker's mill.

Pig Iron.—In the New York market the only recent sale of magnitude is one of 2000 tons to a Boston consumer, the order being taken by a Birmingham furnace at a close price. There is a fair sized export order in the market. The Alabama producers have continued their efforts to get together. One company, however, maintain their usual attitude of independence. We quote as follows: Northern brands, No. 1, $11.50 to $12; No. 2, $10.75 to $11.25; No. 2 Plain, $10 50 to $10.75. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.50; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

Chicago advices indicate that the inquiry is fair for Southern Coke, but at present trade is not very large, buyers waiting to see the outcome of the conference among the Southern furnacemen. The largest sale reported for the week was 500 tons, although a deal involving 2000 to 3000 tons is surmised to have been made. The local producers report a good week's business and are firmer than ever, notwithstanding the low prices made on a few Southern brands. It is believed that our quotations now represent absolute bottom on local Coke. Consumers have lately been pressing for increased deliveries, and the furnace companies are more than ever troubled with endeavoring to make arrangements to supply their needs. We quote for cash as follows :

Lake Superior Charcoal	$11.50 to $13.00
Local Coke Foundry, No 1	11.50 to 12.00
Local Coke Foundry, No. 2	11.00 to 11.50
Local Coke Foundry, No. 3	10.50 to 10.75
Local Scotch, No. 1	11.50 to 12.25
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.35 to 10.60
Southern Coke, No. 3	10.10 to 10.30
Southern, No. 1 Soft	10.85 to 11.00
Southern, No. 2 Soft	10.35 to 10.60

Somewhat larger sales of Pig Iron have been made during the past few days in the Philadelphia market, but the best that can be said of prices is that they were not lower than during the week previous. It is impossible to say what the next turn will be, although on general principles it ought to be toward better prices, as a vast amount of Iron will be melted during the next three or four months. A fair average of prices for seaboard deliveries would be about as follows, with usual rebate according to freights at points within a radius of 100 miles south or west : No. 1 X Foundry, $11 75 to $12 ; No. 2 X Foundry, $10.75 to $11 ; No. 2 Plain, $10.50 to $10.60.

The Bessemer Pig Iron market in Pittsburgh is referred to as very firm. Sales of Bessemer aggregating probably 30,000 tons have been made at prices ranging from $9.60 up to $9.75, Valley. Spot Iron is very firm at $9.60, and it is doubtful if any considerable amount could be had at that price. We quote, f.o.b. Pittsburgh: No. 1 Foundry, $10.40 to $10.50; No. 2 Foundry, $9.90 to $10; Bessemer, $10.25 to $10.40, depending on delivery.

CHICAGO REPORT.

Scrap.—Iron Scrap is in light supply, with a continued good demand. Cast is still very scarce. Old Copper has advanced in sympathy with higher prices for Ingot. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	7 50	....
Malleable Cast	6 50	...
Stove Plate (free of burnt)	5.50	....
Burnt Iron and Grate Bars	3 75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	9¾ to 10c.
Copper Bottoms	....	9 c.
Copper Clips	....	9¾c.
Red Brass	....	8 to 8¼c.
Yellow Brass	....	7 c.
Light Brass	....	4½c.
Pipe Lead	....	3 c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	..	1 c.

Anthracite.—Trade continues rather quiet. The ruling prices of carload lots of 12 tons minimum are as follows :

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$4.75	$5.00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	6.75	7.00
Council Bluffs, Iowa	6.75	7.00
Lincoln, Neb	6.90	7.15
Sioux City, Iowa	7.25	7.50
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	6.75	7.00
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	6.75	7.00
Leavenworth, Kan.	6.75	7.00
Omaha, Neb	6.75	7.00

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

Reports from the West indicate an increasing volume of business, and in some of the leading markets should certainly from its volume be satisfactory to the merchants. It is evident that the retail merchants are buying more freely, and that there is an increased activity in manufacturing concerns, calling for a larger consumption of raw material, tools, &c., and giving more employment to the laboring classes. As a result of this condition of things Western jobbers are doing a fair business, which is reflected by their orders to the manufacturers of the goods which they distribute. In the East the small trade are not buying so freely and apparently the improvement of business, which is most marked in the wheat growing States, has not yet visited the States nearer the seaboard. New England business is only fairly good and the demand has not yet come up to the expectation of the merchants. Prices continue without important modification. In a few lines the tone of the market is decidedly firm, in others only fairly so, while the mass of goods continue without material change. Export trade is good and promises to assume larger proportions, thus affording an important outlet for manufactured products. Collections give little ground for complaint.

Advices from Chicago.—Jobbers report their trade much better than had been expected, considering the condition of the country roads and the widespread snow storms recently prevailing throughout the Northwest. Outdoor operations have been considerably curtailed. Nevertheless, the jobbers' packing floors are well covered with a great variety of orders, comprising general assortments. The movement of staple goods continues excellent, but without any tendency to speculation. Retailers are evidently of the impression that prices of Wire goods will not be materially higher, even if the consolidation is perfected, and therefore they are buying merely what they need. Manufacturers of Poultry Netting and Wire Cloth and other finished Wire products are talking of advancing prices, owing to the higher cost of their raw material. The Tin Plate trade is looking better. Manufacturers are well filled with orders, particularly for Coke Plates, and the movement from jobbers' stocks is about as good as usual at this season, although not what it once was when every tinner made pieced Tinware during the winter months. Heavy Hardware jobbers report a larger movement from stock, not only of Iron and Steel, but all kinds of Wagon Material and Blacksmith's Supplies.

Advices from St. Louis.—The Hardware trade continues to be extremely satisfactory. Dealers are complaining somewhat, but the condition of the roads throughout the West is the explanation of the dealers' complaint. The best evidence, however, of their faith in the immediate future of business is the increased orders they are sending in to the jobbers. The jobbing trade are making preparations for a heavy spring trade, and are in position to take care of it, no matter how good it may be. Orders for new stocks continue to be a noticeable feature. In Builders' Hardware a heavy trade is reported, which continues to be largely confined to the cheaper grades. A heavy trade is reported in staples such as Plain and Barb Wire, Cut and Wire Nails, and an advancing tendency is plainly noticeable in these several lines. Collections are very satisfactory.

NOTES ON PRICES.

Wire Nails.—The trade in Wire Nails has been active, the mills being well occupied in making shipments, many of them having orders which will keep them busy into March. Prices remain unchanged and the general tone of the market is firm. The New York price for small lots of Wire Nails from store is $1.70 to $1.75.

Advices from Chicago.—The situation remains practically as reported last week. Manufacturers are making heavy shipments, but very little buying is noted for March. The higher price named for March is having the effect of making buyers wait until they see that they really need the Nails. Jobbers report a very good trade, somewhat larger in volume than that of last week, with small lots selling at $1.65 from stock.

Advices from St. Louis.—The market is extremely active, and prices are strong and well maintained. Mills are running full, and have sufficient orders on their books to keep them satisfied for some little time to come. Jobbers report an active demand, and quote $1.65 to $1.70, base, for small lots from store.

Cut Nails.—There have been no special developments in the Cut Nail market during the past week. The volume of business is fair but not specially heavy. Manufacturers are desirous of having some understanding or concerted action by which they may obtain higher prices in sympathy with the better condition of things in Wire Nails. New York prices are about $1.30 for small lots from store.

Advices from Chicago.—The manufacturers are stated to be endeavoring to get together with a view of securing better prices. Jobbers report only a light movement from stock, with small lots quoted at $1.45 as before.

Advices from St. Louis—The market is fairly active, and jobbers ask $1.40 to $1.45 for small lots from store.

Barb Wire.—There is a fair activity in Barb Wire, and the trade are placing orders for early shipments.

Advices from Chicago.—The shipments of Barb Wire continue as heavy as previously reported, with no accumulation of stock. The demand for future delivery is light, but manufacturers are not concerned on this account, believing that with the approach of spring the demand will be fully as heavy as, if not heavier than, in previous seasons. Jobbers quote small lots from stock at $1.65 for Painted and $1.95 for Galvanized.

Advices from St. Louis.—The movement in Barb Wire shows continued improvement. Jobbers quote small lots of Painted at $1.70 with the usual advance for Galvanized.

Smooth Wire.—The price of Smooth Wire remains steady. The tone of the market is decidedly firm.

Advices from Chicago.—Manufacturers report a considerably increased inquiry for Plain Wire, which seems to be in greater demand among manufacturers of all sorts of Wire products.

Rivets.—The Rivet market has for some time been irregular, low prices prevailing. At a meeting of the Rivet manufacturers, however, on the 17th inst., the price on bulk Rivets and Carriage and Hame Rivets was advanced to discount 75 and 10 per cent., and on Thousand or Tinners' Rivets to discount 75 and 10 and 5 per cent. The usual freight allowances are continued.

Glass.—Some at least of those who have made present Glass conditions a study are of the opinion that lower prices than those now ruling are a considerable distance off, as the normal consumption of Glass will largely absorb stocks before factories start up again in the fall. Imported Glass has almost ceased to make any unfavorable impression on the market, as it is reported not to exceed 40,000 boxes per month. Local conditions are unchanged, orders coming in slowly and only to cover immediate requirements. Under the influence of competition to secure orders prices continue weak, and 85 and 10 per cent. discount is obtainable for Glass in small lots.

Palm Oil.—A shortage of the higher grades of Palm Oil has caused an advance in price of about ⅛ cent a pound. The market is reported very firm at 5¼ cents per pound for Fancy Lagos and 5 cents for Clarified in 1500-pound casks.

White Lead.—There has been very good distribution in a jobbing way, and some orders for good sized lots are being placed at intervals besides. Prices are unchanged and terms as well remain as quoted for some time past.

Red Lead.—Red Lead is selling in ordinary way only, but to a very fair extent, and prices for both domestic and foreign products remain very steady.

Linseed Oil.—There has been no change in wholesale prices since the decline reported in this column last week, but the market is still rather weak and affected more or less by sharp competition that offsets, momentarily at least, the comparatively high cost of raw material.

Spirits Turpentine. — The market has been quiet throughout the week and prices have remained quite steady.

TRADE NOTES.

The Leos Metal Polish Company have been incorporated at Chicago, Ill., with a capital stock of $3000, by George V. Eddy, A. M. Eddy, Thomas A. Easter and William H. Lahman.

The feature of the week in the Metal trade is the strong position of Copper. Continued heavy exports and an active domestic demand easily keep pace with the production, and prices rule higher than for some time past. Moreover the metal seems destined to enjoy for a long time to come its exceptionally favorable conditions. The strength of the raw material extends to manufactured Copper in its various forms.

Fesier & Davidson have succeeded Fesier & Crawford in the business of selling Stoves, Hardware, Implements, Buggies, &c., Riverside, Iowa.

H. A. Spielman, dealer in Hardware, Stoves, House Furnishing Goods, &c., Fairfield, Iowa, has been succeeded by Chas. H. Gage, who will continue at the old stand.

The ninth annual banquet of the Hardware, Metal and associated trades was given at the Waldorf-Astoria, New York, Monday evening, February 21.

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Metal and Miscellaneous Prices.

CHICAGO, FEBRUARY 24, 1898.

Tin—

traits pigs.....15½@15¾¢

American Tin Plates—

American Base Box Quotations.

Based on 32,000 square inches in a box, which is exactly 2 per cent. more than in the English base box of 14 x 20 Tin Plates. The American base box weighs 110 ℔ and the English base box 108 ℔.

Highest Grade Charcoal—Bright.

Size.	Base.	Contents.	Per box.
10 x 14,	110-℔	...240 sheets	$5.65
"	140-℔	" "	7.25
12 x 12,	110-℔	" "	5.75
"	140-℔	" "	7.50
14 x 20,	110-℔	....120 "	5.65
"	140-℔	" "	7.25
"	160-℔	" "	8.85
"	180-℔	" "	10.45
"	200-℔	" "	13.15

10 x 28 double the price of 14 x 20.

21½x17,	140-℔	....120 sheets	5.35
"	180-℔	" "	6.95

Second Grade Charcoal—Bright.

10 x 14,	110-℔	....240 sheets	5.10
"	140-℔	" "	6.15
12 x 12,	110-℔	" "	5.25
"	140-℔	" "	6.30
14 x 20,	110-℔	....120 "	5.10
"	140-℔	" "	6.15
"	160-℔	" "	7.25

10 x 28 double the price of 14 x 20.

Highest Grade Coke—Bright.

10 x 20,	110-℔	....240 sheets	5.75
12 x 12,	110-℔	" "	4.15
"	140-℔	" "	4.95
14 x 20,	110-℔	....120 "	4.00
"	140-℔	" "	4.85

10 x 28 double the price of 14 x 20.

10x26½,	110-℔	....120 sheets	8.00
10x29½,	110-℔	" "	8.85
10x32½,	110-℔	" "	9.90
"	140-℔	" "	12.35
10x39½,	140-℔	" "	15.00

Old English Method Quotations

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$5.25
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	6 75
	IXX, 14 x 20	8.25
	IXXX, 14 x 20	9.75
	IXXXX, 14 x 20	11.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.50
Allaway Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	4.75
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$3.75
	IC, 10 x 20	5.50
	IC, 17 x 17	7.75
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.00
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	4.50
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔	15¢
95 ℔	20¢
90 ℔	25¢
85 ℔	30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 30 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	10.50@ 12.00
Worcester Grade, 12 to 14 lbs. coating	8.00@ 9.00
STP / L Grade, 10 to 12 lbs. coating	7.50@ 8.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00

	Per box of 56 sheets.
IX, 14 x 56	$12.50
IXX, 14 x 56	14.00
IX, 14 x 60	13.50
IXX, 14 x 60	15.00

Iron and Steel Sheets—

Black.

	Soft Steel.	Refined Iron.
Nos. 10 to 16	2.00¢	2.20¢
17 to 20	2 10¢	2.30¢
21 to 24	2.20¢	2.40¢
25 and 26	2.30¢	2.50¢
27	2.40¢	2.60¢

Russia, Planished, &c. 100 ℔.

Patent Planished, ℔, A....$10.20 } 5%
Patent Planished, ℔, B..... 9.20 } dis.
Craig's Polished Sheet Steel.....8½¢
U.S. Polished Sheet Steel No. 27 A 5.05¢

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake.....12@ 12½¢
Casting Brands.....11¾@ 12¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing, (100 ℔ lots). (To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.08
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots .....℔, 40¢
100-℔ lots.....℔, 36¢
No. 2 (guaranteed over 90% pure).
Small lots.....℔, 34¢
100-℔ lots.....℔, 33¢
Nickel Aluminum Casting Metal.
Small lots.....℔, 39¢
100-℔ lots.....℔, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....℔, 35¢
100-℔ lots .....℔ 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....℔, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter .....℔, 55¢
Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 ℔ or more. Less quantities, 5¢ ℔ additional.

Wider than / And including	6-in. 14-in.	14-in. 16-in.	24-in. 30-in.
	℔	℔	℔
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-℔ casks.....5¾¢
300-℔ casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping .....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8⅝¢

Lead—

Soft Pig Lead .....4¢
Bar.....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&10%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead GalvanizedLapJoint80&25%
Double Bead GalvanizedSlipJoint80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized .....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne .....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dis. $2.35
Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. ..℔ square,	$4.75	$4.50
Galv.....℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.. .....8 @ 12¢
Iron Paint, Bright Red.....℔ ℔ 2 ¢
" " Brown.....℔ ℔ 1½¢
" " Purpie .....℔ ℔ 2½¢
" " Ground in oil, B. Red, ℔ ℔ 6½¢
" " Ground in oil, Red. ℔ ℔ 6½¢
" " Ground in oil, Brown, ℔ ℔ 5½¢
" " Ground in oil, Purple, ℔ ℔ 6½¢
Linseed Oil, Boiled, in bbls.....44¢
Linseed Oil, Raw, in bbls.....42¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs 3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal..... .34¢
Spirits Turpentine, in bbls., ℔ gal....38¢
Asphaltum, Trinidad Refined, ℔ ton.$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet.....$1.25
Roofing Pitch, ℔ bbl of 300 ℔.....$3.00

NEW YORK, FEBRUARY 25.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb. 40¢
100-lb lots.....₩ lb. 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₩ lb. 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.56	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb. 8½¢
Hallett's.....₩ lb. 7¾@8¢
Japanese.....₩ lb. 7½@7¾¢

Brass—Planished.....net

Roll and Sheet.....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¾-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝-in.	.38
⅜-in. up to ½ in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger	Special
2-in. to 3-in., to No. 19, inclusive.	38

35% off.

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ lb 18½@19¢ basis
Ingot.
Lake.....12½¢
Ansonia Grade Casting.....11½¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe--

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₩ lb, 2 00....	2.25¢
Nos. 17 to 21.....	₩ lb, 2.10....	2.35¢
Nos. 22 to 24.....	₩ lb, 2.20....	2.45¢
Nos. 25 and 26...	₩ lb, 2.30....	2.55¢
No. 27.....	₩ lb, 2.40....	2.65¢
No. 28.....	₩ lb, 2.50....	2.75¢
American B. B.....	₩ lb, 4¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ lb. A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

Nos. 10 to 16.....	₩ lb, 12¢	80%
Nos. 17 to 21.....	₩ lb, 13¢	
Nos. 22 to 24.....	₩ lb, 14¢	
Nos. 25 to 26.....	₩ lb, 15¢	
No. 27.....	₩ lb, 16¢	
No. 28.....	₩ lb, 17¢	
No. 29.....	₩ lb, 19¢	
No. 30.....	₩ lb, 21¢	

36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½@4¼¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....38¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's. 100@500 lb..... 6 ¢
Lead. Amn. White, in oil..... 6 ¢
Lead, Red. bbls. and ½ bbls..... 6 ¢
Lead, Red, kegs..... 6 ¢
Ochre, American..... 1½¢
Red Venetian, American..... 1¾¢
Linseed Oil:
Raw, ₩ gal.....45@46¢
Boiled.....47@48¢
Spirits Turpentine:
In bbls.....36¢
In cases.....44¢
Putty:
In barrels and ½ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5¼¢
Clarified.....₩ lb 5 ¢
Accra.....₩ lb 4¾¢
Half Jack.....₩ lb 4½¢
Cecilia.....₩ 100 lb $4.85
Choice Red.....₩ 100 lb 4.60
(*Spot Oil, ½c. ₩ lb higher.*)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline.....	₩ gal.	10@11¢
Kerosene.....	₩ gal.	8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....70%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks....65%
Soldering Unions.....70%
" Nipples.....70%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joluts.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Augle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..05%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897..... 40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons..... ...75%
Galvanized Iron Range Boilers above 52 gallon.....65%
N. B.—5 % extra on Staudard 30, 35 and 40 gal. Boilers.
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 galion..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....60%
" " " Backs Plain.....60%
" " " " Galvanized....60%
" " " Legs Plain.....60%
" " " " Galvanized....60%
" " " Backs with air chambers, Plain.....60%
Cast Iron Sinks, Backs with air chambers Galvanized.....60%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.

Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock. ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₩ bbl.	$1.48@$1.49
Rosin, E. & F.....	₩ bbl.	1.55@ 1.60
Rosin, G. & H.....	₩ bbl.	1.70@ 1.80
Rosin, I. & K.....	₩ bbl.	1.85@ 1.90
Rosin, M. & N.....	₩ bbl.	2.10@ 2.20

Seamless Brass Tubes—

Net List, Feb. 1. 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₩ sqr.	$3.50@$4.50
No. 1 Bangor Ribbon.....	3.00@ 3.25
Pen Argyle, ₩ sqr.....	3.25@ 3.50
Peach Bottom, ₩ sqr.....	4.75@ 5.60
No. 1 Chapman, ₩ sqr....	3.00@ 4.25
Lehigh Slates, ₩ sqr... ..	3.25@ 3.80

Vermont:

Sea Green, ₩ sqr.....	$2.45@$3.05
Purple, ₩ sqr.....	3.75@ 4.00
Variegated Purple.....	2.25@ 2.90
Unfading Green, ₩ sqr...	3.50@ 4.00
Red, ₩ sqr.....	8.50@10.50

Solder and Soldering Fluids— Solder—

½&½ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels. ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb.....4¢
2% dis.

Yager's Soldering Salts.
½ lb bottles, each.....30¢
Large quantities, ₩ lb.....40¢

Soldering Coppers—

Per lb.....15¢@16¢ net

Spelter—

Western Spelter.....4½¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15½¢
Straits, pigs, lb lb.....14½@15¢
Straits, in bars, ₩ lb.....15½@16¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14	$4.75
		14 x 20	
" "	IX,	10 x 14	5.75
		14 x 20	
" "	IXX,	14 x 20....	6.75
" "	IXXX,	14 x 20....	7.75
" "	IXXXX,	14 x 20....	8.75
" "	DC,	12½ x 17....	4.25
" "	DX,	12½ x 17....	5.25
Allaway Grade,	IC,	10 x 14	4.25
		14 x 20	
" "	IX,	10 x 14	5.00
		14 x 20	
" "	IXX,	14 x 20...	5.75
" "	IXXX,	14 x 20...	6.50
" "	IXXXX,	14 x 20...	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14	$3.50 @ 3.60
		14 x 20	
" "	IX,	10 x 14	4.35 @ 4.45
		14 x 20	

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb.....10¢
95 lb.....15¢
90 lb.....20¢
85 lb.....25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating.....	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating.....	8.00 @ 9.25
STP $\frac{L}{T}$ Grade, 10 to 12 lb coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke,	IC,	14 x 20..... $4.25
	IX,	14 x 20..... 5.25

Terne Plates—

Worcester Grade, IC, 14 x 20.....	4.25
20 x 28.....	8.50
Dean Grade, IC, 14 x 20.....	4.00
20 x 28.....	8.00
Gilbertson's Old Method, IC, 14 x 20..	7.50
20 x 28..	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 189 .

1¼ and less, Plain....57&10&10&10&10%
1¼ and less, Galv. 50&10&10&10&10%
1½ and larger, Plain .67&10&10&10&10%
1½ and larger, Galv..55&10&10&10&10%
Screw and Socket Joint Casing.....65%
Inserted Joint Casing.....60%
Boiler Tubes, 2¼ inch and smaller.72½%
" 2½ inch and larger 75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb..... 6¼¢

ALPHABETICAL LIST OF ADVERTISERS.

Adriance Machine Works... 75
Ætna-Standard Iron & Steel Co..... 66
American Corrugating Co.. 68
Apollo Iron & Steel Co.. 1
Arcade Mfg. Co..... 23
Atlanta Steel & Tin Plate Co. 70
Bangor Excelsior Slate Co... 57
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Colwell Lead Co..... 21
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Double Truss Cornice Brake Co..... 71
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Frand, M. J. & Co..... 63
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Garry Iron & Steel Roofing Co..... 68
Globe Ventilator Co..... 64
Gobeille Pattern Co.. 18
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Gordon, W. J..... 75
Gorton & Lidgerwood Co.... 1
Graff & Co 11
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Greene, W. F..... 18
Griffing, A. A. Iron Co..... 15
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Gummey, McFarland & Co.. 65
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Kelsey Furnace Co..... 12
Kemp, C. M. Mfg. Co..... 20
Kieckhefer Bros. Co..... 27
Kleley, T..... 1
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Lawrence-Letts Elbow Co... 18
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Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

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Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

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Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Northrop, H. S., 40 Cherry St., N. Y.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Cocks, Ball, Basin and Stop.
Landers, Frary & Clark, New Britain, Conn.
Peck, Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros. Co., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N.Y.
Cauton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh. Pa.
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Gummey, McFarland & Co., Phila., Pa.

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Arcade Mfg. Co., Freeport, Ill.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Ciucinnati, O.
Ohl. Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, Ohio.

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Berger Bros. Co., Phila., Pa.
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Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

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Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.
Oster Mfg. Co., Cleveland, Ohio.

Dish Washers.
Buckeye Dish Washer Co., Toledo, O.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dumb Waiters.
Energy Mfg. Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Couklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Hangers.
Berger Mfg. Co., Canton, O.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & VanWinkle Co., Newark, N.J.
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Eddy Electric Mfg. Co., Windsor, Conn.

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Eddy Electric Mfg. Co., Windsor, Conn.

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St. Louis Stamping Co., St. Louis, Mo.

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Koven, L. O. & Bro., 18 Spruce St., N. Y.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

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Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

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Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
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Carton Furnace Co., Utica, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Graff & Co., 208 Water St., N. Y.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Pease, J. F., F'ce Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Ct.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N.Y.
Tubular Heating & Ventilating Co., Phila., Pa.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Shepard, Sidney & Co., Buffalo, N. Y.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Colt, J. B. & Co., 115-117 Nassau St., N. Y.
Kent, C. M. Mfg. Co., Baltimore, Md.
Wilson, F. Cortez & Co., Chicago, Ill.

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St. Louis Stamping Co., St. Louis, Mo.

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Jackson, W. Sons, 246 Front St., N. Y.

Grinding Mills.
Straub, A. W. & Co., Phila., Pa.

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Whelan, Dennis. J., Troy, N. Y.

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Palmer, I. E., Middletown, Ct.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 95 Liberty St., New York.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Howard Furnace Co., Syracuse, N. Y.
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Kleckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
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Illinois Pure Aluminum Co., Lemont, Ill.

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Dover Stamping Co., Boston, Mass.
Parks & Parks, Troy, N. Y.

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Hanson, F. B., 175 Centre St., N. Y,

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Iron, Kalameined.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

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Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Kitchen Specialties,
Dover Stamping Co., Boston, Mass.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Schratwiesers Metal Lath Works.

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Wheeler, E. S. & Co., New Haven, Ct.

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Colwell Lead Co., 63 Centre St., N. Y.

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Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic.*)

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Munsell, Eugene & Co., 218 Water St., New York.

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Kleckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
Shepard, Sidney & Co., Buffalo, N. Y.

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Eddy Electric Mfg Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Upham, Ely C., 35 Dey St., N. Y.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

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Franke, H, Cleveland, Ohio.

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Stocking, E. B., Washington, D. C.

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Wister, L. & R. & Co., Philadelphia, Pa.

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Blumer, Doscher Mfg. Co., Brooklyn, N. Y.

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Dixon, Jos. Crucible Co., Jersey City, N. J.

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Millar, C. & Son, Utica, N. Y.

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Oster Mfg. Co., Cleveland, Ohio.
Peck Bros. & Co., New Haven, Conn.
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Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wheeler, E. S. & Co., New Haven, Ct.
Wilson, R. M. Mfg. Co., Rome, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

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Adriance Mach. Works, Brooklyn, N.Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
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Stiles, E S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.
West Mfg. Co., Buffalo, N. Y.

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Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Robinson, J. M. & Co., Cincinnati, O.

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Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.

Range Boilers.
Koven, L. O. & Bro., 18 Spruce St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Bowen Mfg. Co., Fond du Lac, Wis.
Cooper & McKee, Brooklyn, N. Y.
Grand Rapids Refrigerator Co., Grand Rapids, Mich.
Gurney Refrigerator Co., Fond du Lac, Wis.

Registers.
Excelsior Steel Furnace Co., Chicago, Ill.
Highton, Wm. & Sons, Boston, Mass.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Roofing Edger.
Bell, W. C., Syracuse, N. Y.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N.Y.
Burton, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N.Y.

Roofing Seamers.
Burritt, O. W. & Bro., Weedsport, N.Y.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N.Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Adriance Mach. Works, Brooklyn, N.Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y.
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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pocock, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, Ohio.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co. Brooklyn, N. Y.
Toledo Mach. & Tool Co., Toledo, O.
West Mfg. Co., Buffalo, N. Y.
Whelan, Dennis J., Troy, N. Y.

Sheet Metal Work.

Willis Mfg. Co., Galesburg, Ill.

Sheets, Iron and Steel.

Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Sheets, Galvanized.

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.

Berger Mfg. Co., Canton, O.
Burden, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Iron City Mfg. Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.
Thorn Shingle & Ornament Co., Philadelphia, Pa.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

Siding. *(See Roofing and Siding.)*

Skylights.

Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.

Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.

Whelan, Dennis J., Troy, N. Y.

Snow Guards.

Halliday, M., East 9th St., N. Y.

Solder.

Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.

Burgess Soldering Furnace Co., Columbus, Ohio.

Speaking Tubes and Whistles.

Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties, Sheet Metal.

Vogel, Wm. & Bros, Brooklyn, N. Y.

Stamped Ware, Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.

Steam and Gas Fitters' Supplies.

Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 18th St., N. Y.

Steel Stamps and Stencil Dies.

Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.

Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.

Hoffman, Geo. W., Indianapolis, Ind.

Stove Patterns.

Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros. Co., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Collars.

Paxton Hdw. Co., Paxton, Ill.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.

Parks & Parks, Troy, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.

Arcade Mfg. Co., Freeport, Ill.
Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stoves and Ranges.

Beckwith, P. D., Est. of, Dowaglac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Graff & Co., 208 Water St., N. Y.
Magee Furnace Co., Boston, Mass
Portsmouth Stove & Range Co, Portsmouth, O.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Sheppard, Isaac A. & Co., Phila., Pa.
Syracuse Stove Works, Syracuse N.Y.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.
White-Warner Co., Taunton, Mass.

Stoves and Ranges, Gas.

Clark, Geo. M. & Co., Chicago, Ill.
Griswold Mfg. Co., Erie, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Clark, Geo. M. & Co., Chicago, Ill.
Cleveland Foundry Co., Cleveland, O.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.

Tea Kettles.

Hill-Whitney Aluminum Co., Boston, Mass.
Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

Tinners' Tools, Machines and Supplies.

Berger, L. D., Philadelphia, Pa.
Berger Bros. Co., Phila., Pa
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher, A. F. & Co., 31 Fulton St., N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co, 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.

Vogel, Wm. & Bros. Brooklyn, N. Y

Tin Plate. *(Mfrs. of.)*

Ætna Standard Iron & Steel Co., Bridgeport, O
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Berger, L. D., Philadelphia, Pa.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Ellwood Tin Plate Co., Ellwood City, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.

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Keen & Hagerty Mfg. Co., Baltimore, Md.
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Saunders', D. Sons, Yonkers, N. Y.

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Goodrich, Judson A. Co., 120 Beekman St., N. Y.
Jenkins Bros., 71 John St., New York.

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Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.

Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.

Littleford Bros., Cincinnati, O.
Marston, I. G. & Co., Boston, Mass.

Water Closets.

Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.

Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.

Miner & Peck Mfg. Co., New Haven, Ct

Wiping Cloths.

Porsch, John, Erie, Pa.

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THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

HARDWARE SALESMAN who has had from one to five years' experience; would prefer one who understands bookkeeping and a little about buggies and farm machinery. A. R. Kanney, Greenspring, Ohio. Feb. 26

A first-class TIN and SHEET IRON WORKER who understands plumbing, steam fitting, &c.; must be sober; state wages wanted and particulars. John C. Rice, 34 West Main street, Johnstown, N. Y. Feb. 26

TRAVELING SALESMEN to sell staple article in the tin and hardware line on commission; must come well recommended. "Salesmen," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 26

A CORNICE MAKER; applicant must be capable and willing to do anything connected with the cornice, skylight and tin roofing business, inside and out, and competent to be left in charge; must be able to prove himself thoroughly reliable in all respects "Conn," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

Good STOVE SALESMAN for Illinois, Iowa, Minnesota; on commission for a good line. "Illinois," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 26

Competent man as FOREMAN of sheet metal works. Address, stating qualifications and salary expected, "Sheet Metal," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 26

By April 1 a first-class TINNER; one who understands roofing, jobbing, tinware, furnace work, stove and range repairing, and can do common jobs of plumbing and pipe work; must be strictly temperate and reliable; steady work for the right man. Lock Box No. 243, Palmyra, N. Y. Feb. 26

An experienced TINNER who can do all work that comes to a country tin shop, estimate and lay out work; must understand roofing and some plumbing; state age and wages wanted. Lock Box 242, Stockton, Ill. Feb. 26

First-class FOREMAN for Montana to take charge of plumbing, hot water and steam heating department; one accustomed to job work and estimating; state wages and give references. "G. F.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

TRAVELING SALESMAN thoroughly posted in enameled ware and acquainted in New England territory; state age and full previous experience, or no attention. "New England," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 19

FOREMAN and CUTTER for cornices and jobbing shop; must be up to date in all requirements; a good situation to the right man. Max Jennings, Logansport, Ind. Feb. 19

An experienced TINNER with some knowledge of plumbing and hot air heating; must be sober and reliable; state wages wanted. Lock Box 73, Newton, N. J. Feb. 19

A FOUNDRY FOREMAN and ASSISTANT SUPERINTENDENT in a large stove foundry; a man who has practical knowledge of stove plate molding and foundry; no applications will be considered that do not state age, references, experience, present or last employers and salary expected. Address "Stove Manufacturer," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 19

By March 15 a PLUMBER and TINNER; one who can do all work that comes to a country tinshop; must be strictly temperate and not use tobacco; address with reference from last employer and wages wanted per day, "Iron Pipe," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 19

Incandescent gas mantle SALESMAN wanted; a good side line in any city or town among plumbers, gas fitters and others: finest goods, prices guaranteed. Tucker & Koester, 116th street, East River, New York City. Feb. 19

Good all around TINNER and SHEET IRON WORKER for country shop; must have knowledge of hardware; one who can speak the Holland language preferred: state age, references and wages expected. John Q. Smith, Palmyra, N. Y. Feb. 19

A STOVE PATTERN FITTER, a thoroughly reliable man; must be able to work in white metal and brass, and be acquainted with all work pertaining to stove patterns; to a first-class man steady work will be given; state reference and wages expected. "B," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 19

SITUATIONS WANTED.

Experienced STOVE PATTERN FITTER and METAL PATTERN MAKER; steady job wanted. Richard Schulze, 6 Hoffman street, Allegheny, Pa. Feb. 26

By TINSMITH of ten years' experience; good on furnaces, roofing and all work around a country job shop; sober and steady; position by the year wanted; can give good references; wages moderate. E. B. Peck, York, Livingston County, N. Y. Feb. 26

By a good all around TINSMITH at roofing, assortment or furnace work and all kinds of general job work; will work reasonable; am married; have had 12 years' experience. "J. K.," 248 Trenton avenue, Buffalo, N. Y. Feb. 26

By a competent young man who understands plumbing thoroughly; also outside tin work; wages, $12 per week. R. B. Robinson, Center Moriches, N. Y. Feb. 26

By TIN and SHEET IRON WORKER; 25 years' experience; last ten years as foreman; thoroughly understands furnace work and ventilation, can lay out work, and make estimates on furnace work, hot water or steam and ventilation; should prefer Chicago or that vicinity. "G. H. C.," care of Boston office, 70 Kilby street. Feb. 26

By a first-class PLUMBER, STEAM, HOT WATER and GAS FITTER; has license for New York City; can take charge and lay out work. John Glass, 435 West Thirtieth street, New York City. Feb. 26

By a registered PLUMBER, GAS and STEAM FITTER; nine years' experience; will work in city or country. Wm. H. Ahn, Norristown, Pa. Feb. 26

A competent MECHANICAL ENGINEER of 12 years' experience, sober and industrious, capable of taking charge of steam engine and dynamo and of making all repairs, good practical knowledge of electrical work, wiring, &c., also of steam heating, desires position; good references as to capability and character. J. A. Wright, Floral Park, L. I., N. Y. Feb. 26

As DRAFTSMAN and CUTTER or as general workman with a reliable cornice firm by a thoroughly competent, reliable and experienced mechanic at all branches of cornice, tin and sheet iron work; sober and industrious. "A Hammersman," office of *The Metal Worker*, 232-238 William street, New York Ctiy. Feb. 26

By a TINNER and GENERAL JOBBER; good workman at roofing, spouting, &c. Irving Werner, Phillipsburg, Pa. Feb. 26

By an all around TINSMITH and SHEET IRON WORKER; 18 years' experience; also slating and bicycle work. "W. C.," Tarrytown, N. Y. Feb. 26

By a CORNICE MAN of wide experience at estimating, cutting and superintending; thoroughly up to date in all requirements; position in large shop preferred. "F. W.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

FOUNDRY FOREMAN; 18 years' experience in all branches of stove manufacture; steady, sober and can be depended on; can take entire charge of foundry and mounting room; will work to interest of employer; reasonable salary. "L. L.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

By a first-class PLUMBER; thoroughly competent at all branches; can give best of reference. "J. B.," office of *The Metal Worker*, 232-238 Willaim street, New York City. Feb. 26

To sell in the New England States, a first-class line of stoves and furnaces on commission; advertiser is able to do a large business; can furnish best of references. "M. F.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

A line of stoves to sell on commission in Greater New York; advertiser is experienced and well known to the trade; can give first-class references; will do a large business with the right goods. "R. C. F.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

By PLUMBER, STEAM and HOT WATER FITTER; fine lead worker, also good tinner; familiar with work in the West and Southwest; Montana or Coast States preferred; 15 years' experience, and can give Al reference. "Plumber," 620 Clybourn street, Milwaukee, Wis. Feb. 26

In cornice shop as ASSISTANT CUTTER. "Bob," Box A, Y. M. C. A. Building, Lancaster, Pa. Feb. 26

As FOREMAN or CUTTER in cornice shop, by married man; age 35; 17 years' experience; can solicit, manage, estimate and use the tools; references. "Wanted," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

As TRAVELING SALESMAN or MANAGER in hardware, mill, plumbing supplies or oils, paints, &c.; number of years' experience in store and traveling; strictly temperate; state territory and if salary and expenses. "H.," No. 226, office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

As SUPERINTENDENT or FOREMAN of foundry, by a man of 20 years' experience in the construction of stoves, steel ranges, fire place furniture and jobbing work; very successful in the management of men; A1 references as to character and ability. "Foreman," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 26

As FOREMAN and CUTTER in a roofing, cornice and skylight shop, by a first-class mechanic; steady and sober: thoroughly understands the business; wages moderate. "Reliable," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

I am licensed and registered PLUMBER for Brooklyn and New York, also practical tin and sheet iron worker, furnaces, ranges and heaters; can estimate and command considerable trade; can get sole agency for furnace and range company; have been a foreman. "C. E. J.," office of *The Metal Worker*, 232-238 William street. New York City. Feb. 26

PLUMBER and GAS FITTER wants work in city or country; first-class neat worker; 22 years' experience; understand plans; would study employer's interest; honest, sober and reliable. J. Usher, plumber, 475 East 115th street, New York City. Feb. 26

ASSISTANT CORNICE CUTTER; first-class cornice, skylight and job workman; experienced in suction pipe and ventilating; equally proficient at all other work done in a good shop. "Assistant H. S.," General Delivery, Newark, N. J. Feb. 26

As TINNER, by a young man who can do all kind of inside and outside work; some experience at pipe fitting; temperate and honest; reference. Perry Shipman, Celina, Ohio. Feb. 19

By a first-class ELECTRO-PLATER; can do all kinds of plating and oxidizing, &c.; can give best of reference. "B. C. W.," 195 Butterworth avenue, Grand Rapids, Mich. Feb. 19

Young man 23 years of age, two years' experience at tinners' trade; inside and outside work; desires to finish trade, also plumbing; reference. "B. W. F.," Box 272, Addison, N. Y. Feb. 19

By a young man 24 years of age, who has had nine years' experience at plumbing and gas fitting; temperate, married; willing to go anywhere. G. D. Hancock, 258 Castle street, Geneva, N. Y. Feb. 19

By a young man 20 years of age, who has had two years' experenice as hardware clerk and two years at plumbing, tinning, furnace work, &c.; wages moderate; good reference; strictly temperate; city or country. F. J. Eagen, Minooka, Pa. Feb. 19

By a man up to date, as FOREMAN of mounting department or INSPECTOR; can give best of reference as to ability. Address J. F. Hyatt, 14 Wilson street, Albany, N. Y. Feb. 19

BOOKKEEPER and STENOGRAPHER, six years' experience as a bookkeeper and one year as traveling salesman; graduate of high school and University; also hold county teachers' certificates; at present employed, but desires to change; references. B. D. Higgins, Piqua, Ohio. Feb. 19

By a practical TINSMITH, furnace, sheet iron work, slating and general jobbing; 18 years' experience; married man with family. Coleman Baxter, Canal Winchester, Ohio. Feb. 19

As FOREMAN in cornice and sheet metal works; good draftsman, long experience. "Amer. No. 219," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 19

By a young man 19 years of age, as TINSMITH in some country shop; has had about four years' experience at tinning, pump and stove work; has also worked at plumbing; can furnish references; reasonable wages expected. Roscoe Batey, P. O. Box 99, Patchogue, L. I. Feb. 19

In a stove works, many years' experience in the several capacities of stove plate and stove pattern molder, foundry foreman, superintendent and foundry expert; can report at short notice at any point, and accommodate myself to circumstances, having no family; references. J. T Peet, librarian of the Military Home, Leavenworth, Kan. Feb. 19

By a first-class BRASS and LEAD PLUMBER; can do hot water fitting, roofing, furnace, pump work and general jobbing; 15 years at trade; first-class references; New York State; state wages. Jas. A. Reber, 204 East 105th street, New York City. Feb. 19

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Getting Out the Pipe,
Piping the House,
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Fig. 107.—Planishing Tea-Kettle Side.

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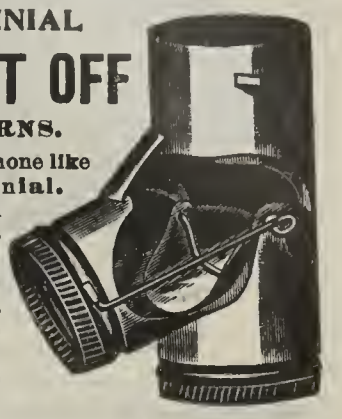


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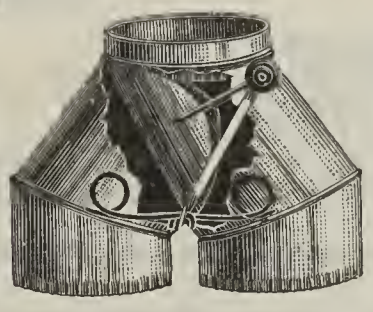


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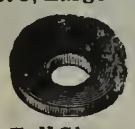
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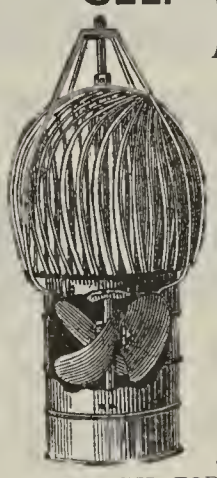
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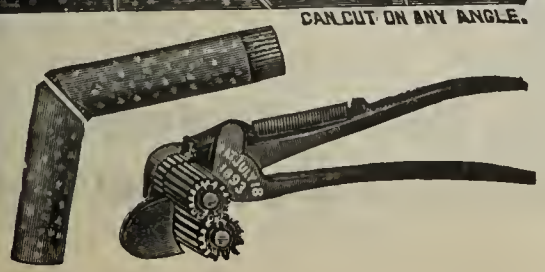
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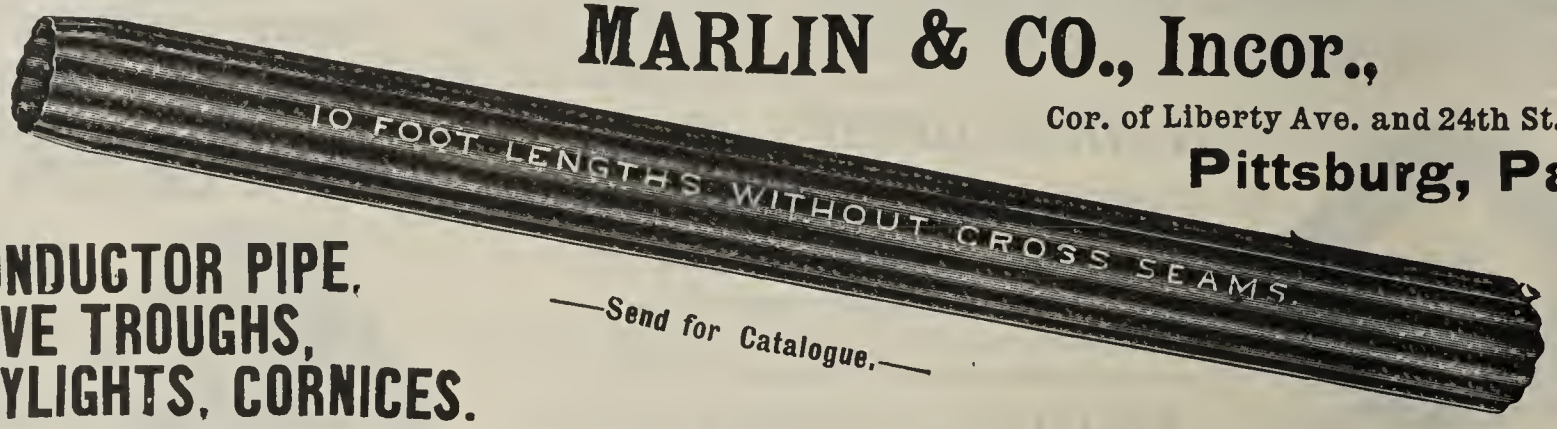
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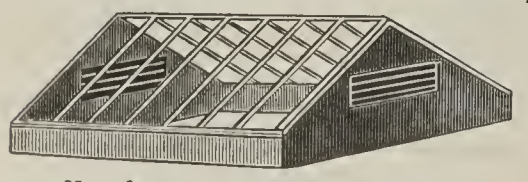
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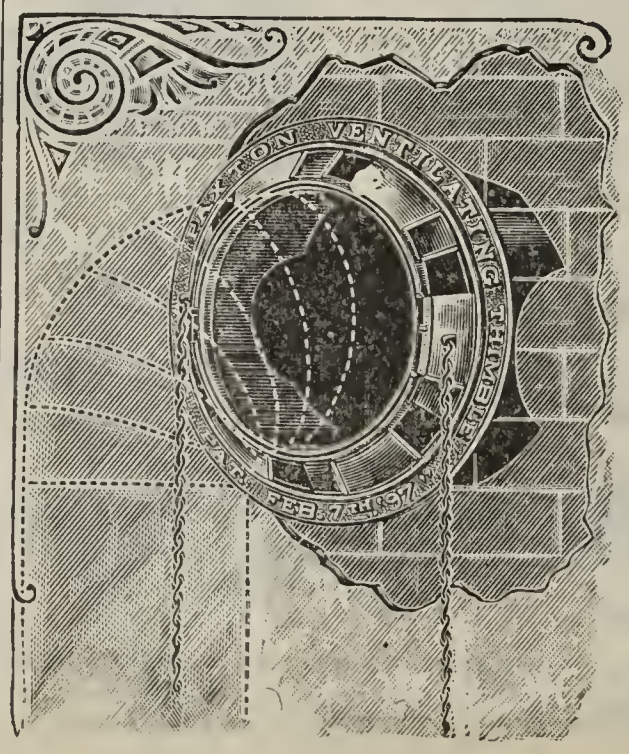
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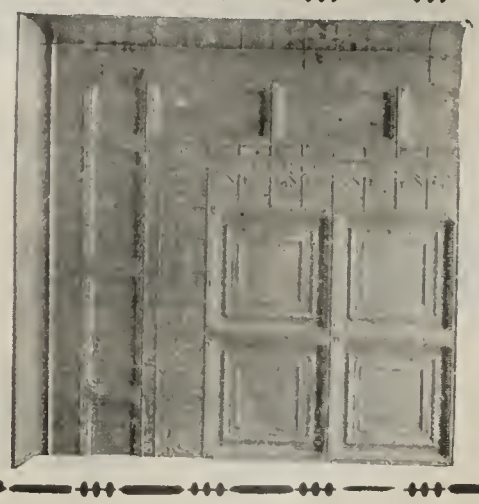
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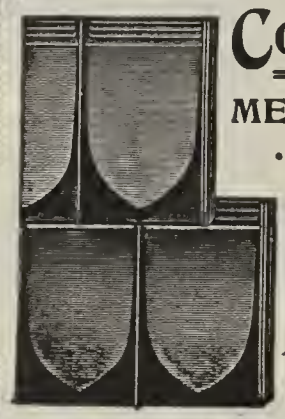
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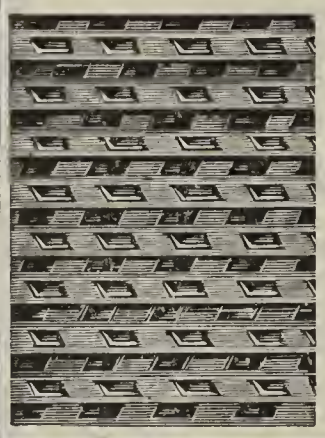
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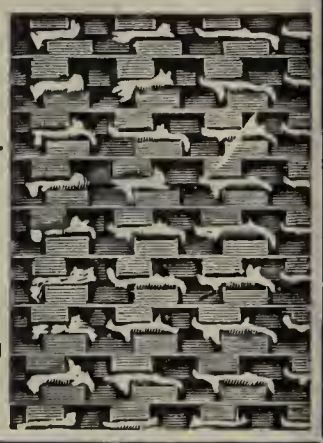
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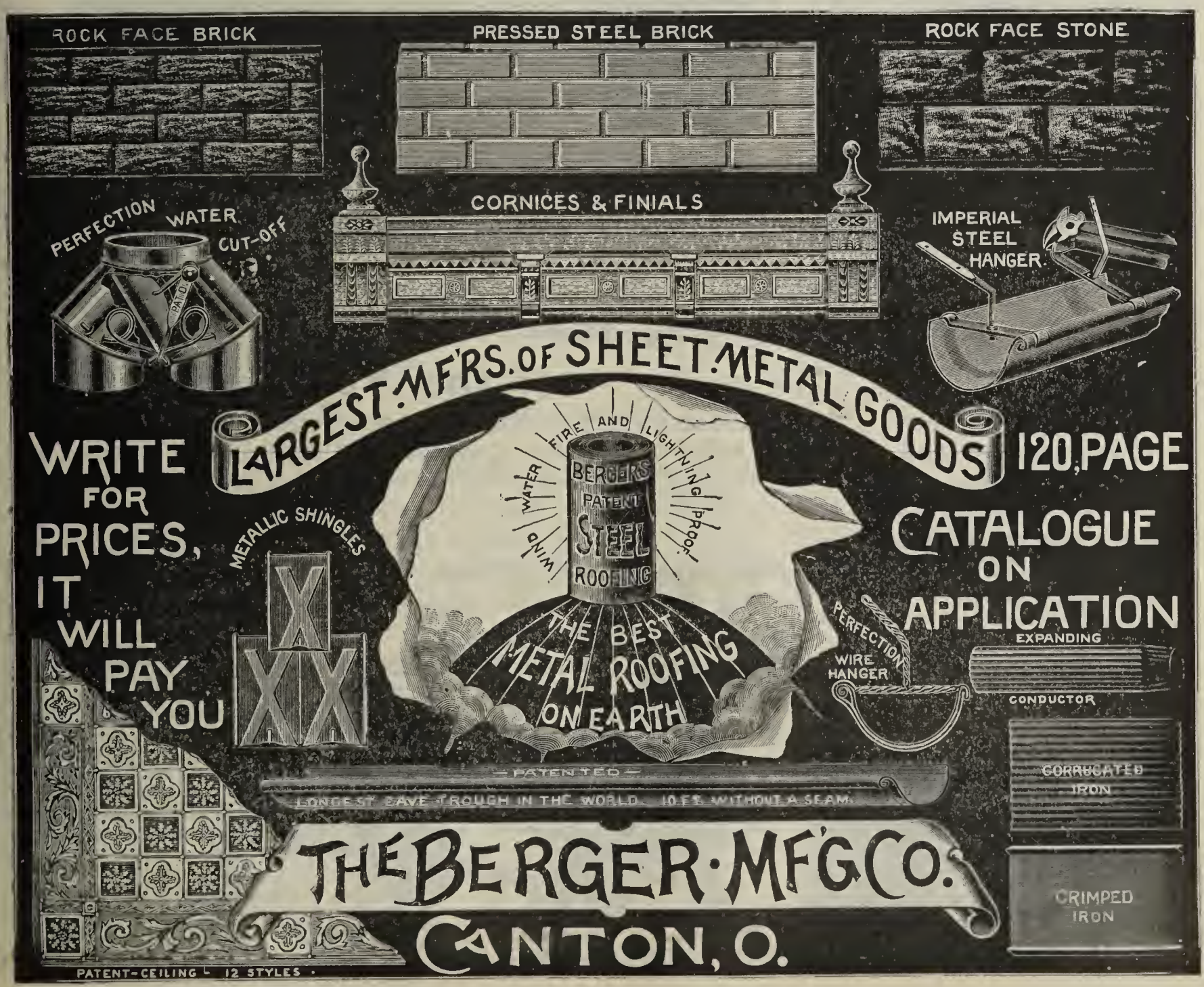
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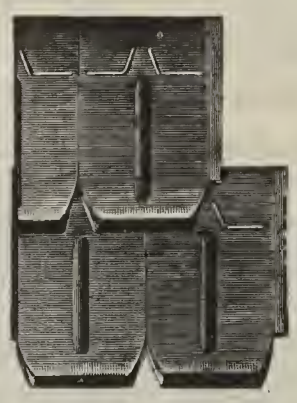
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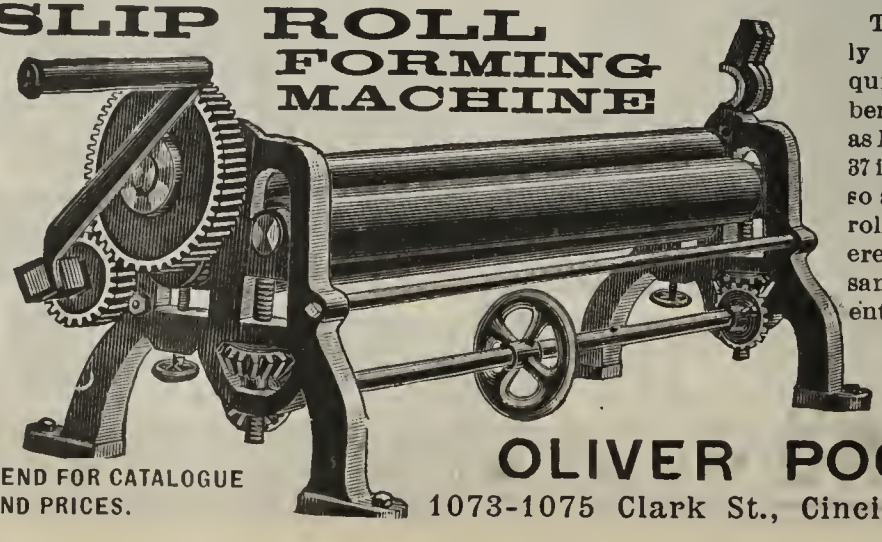
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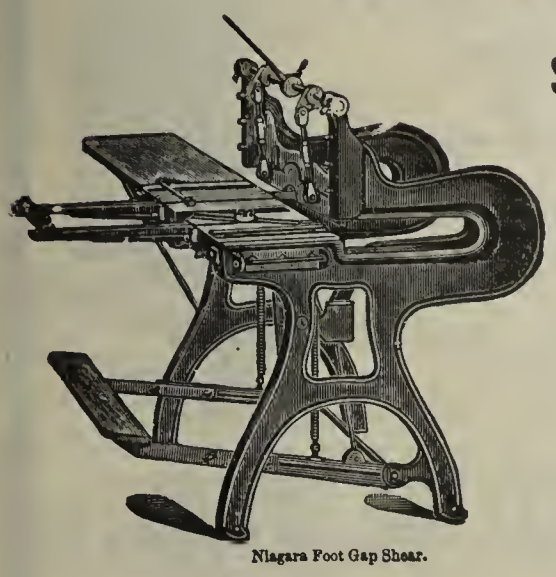
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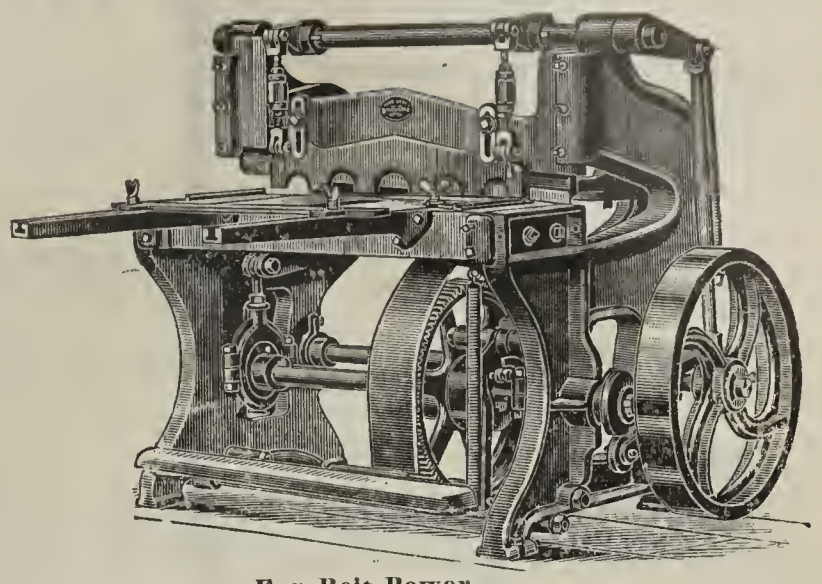


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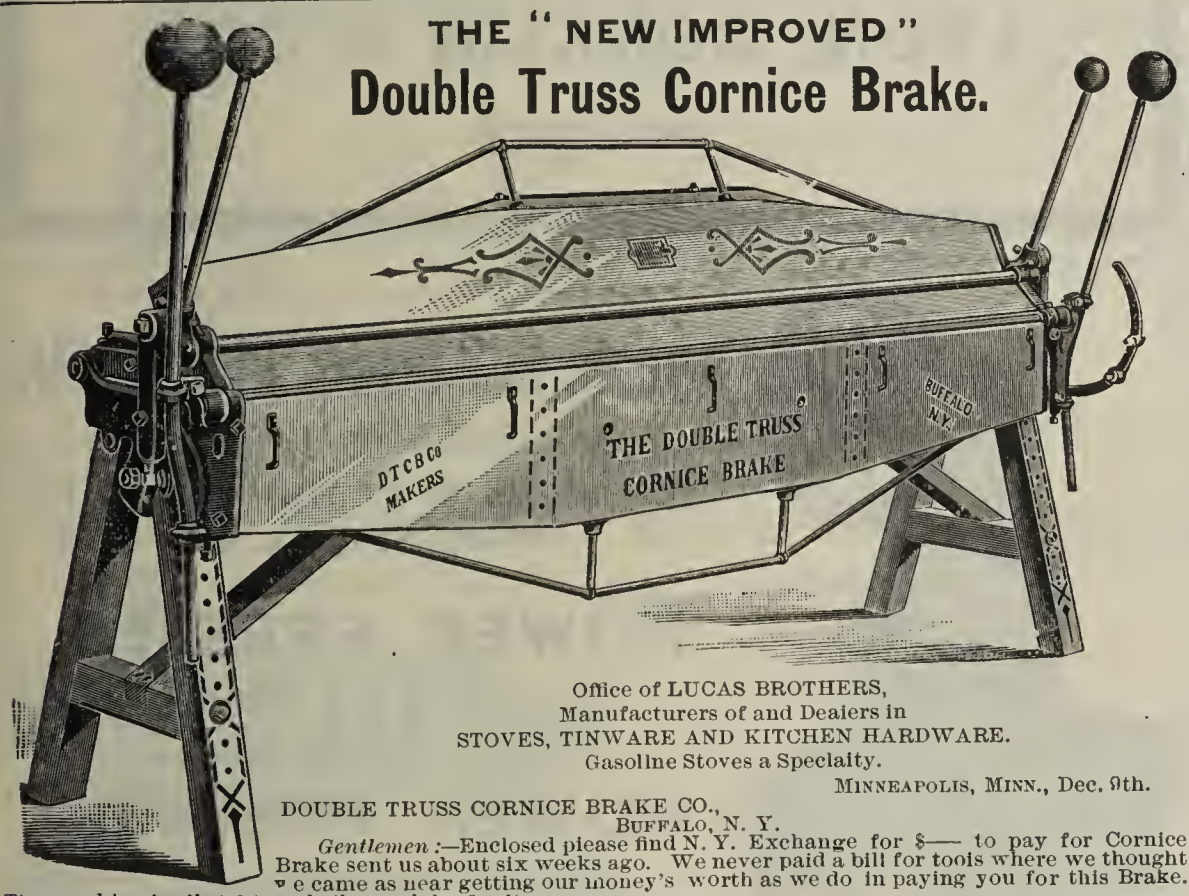
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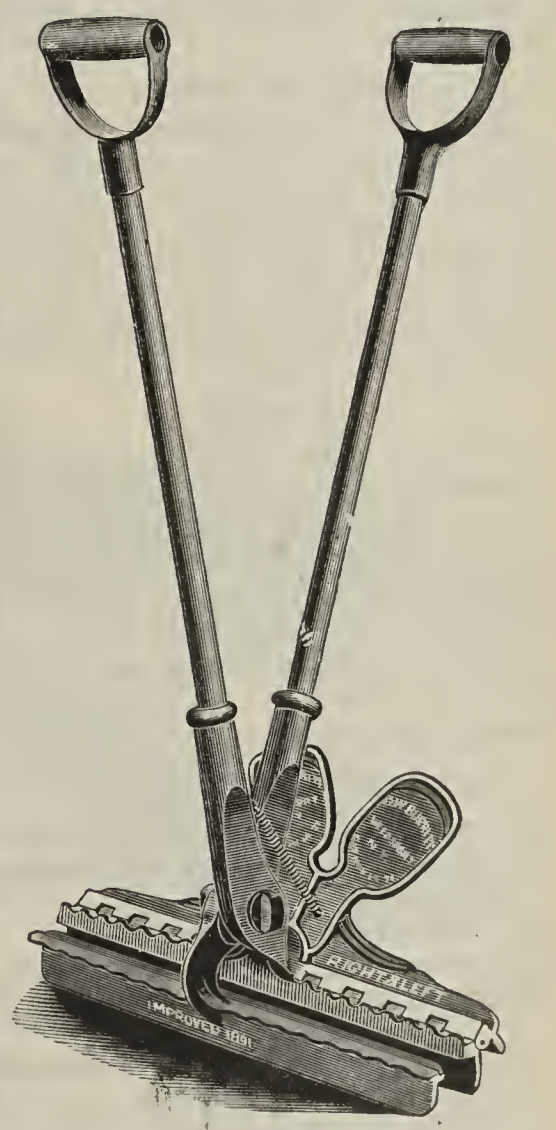
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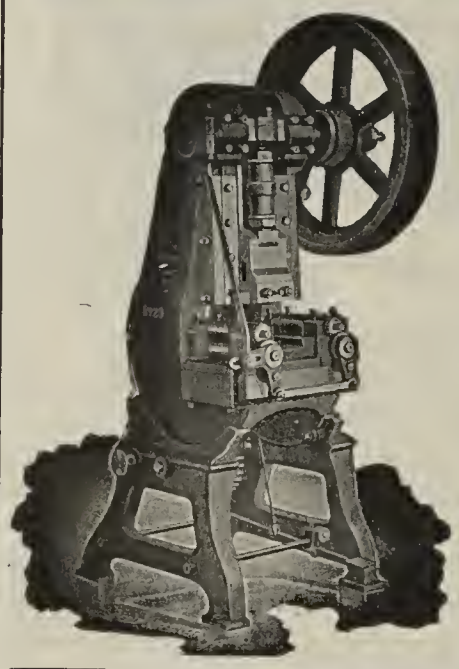
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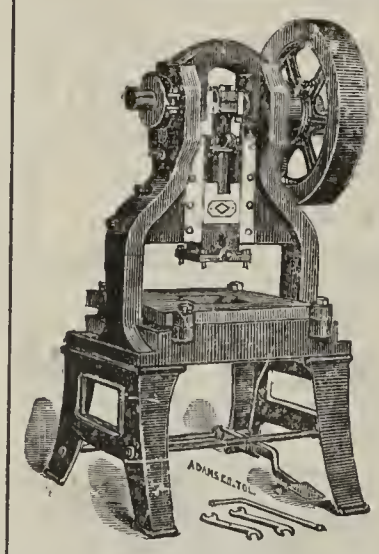


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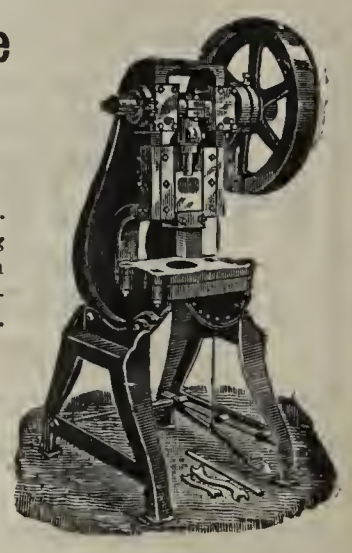
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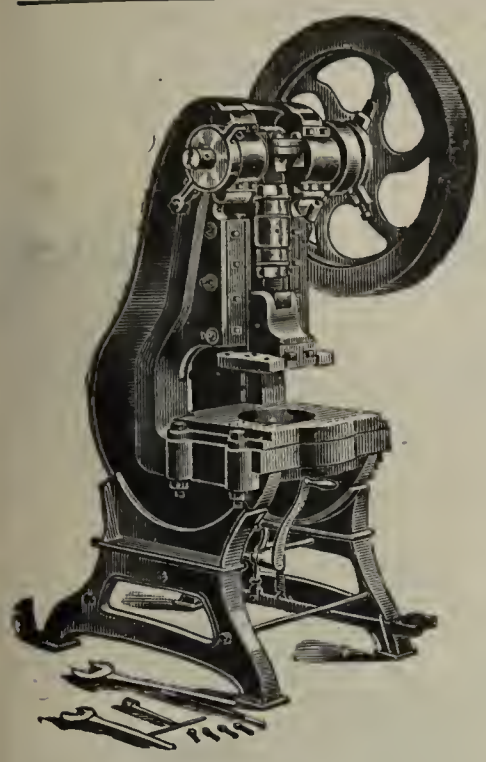


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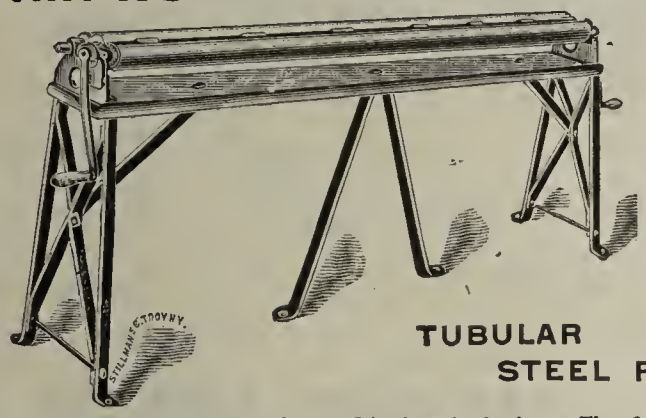
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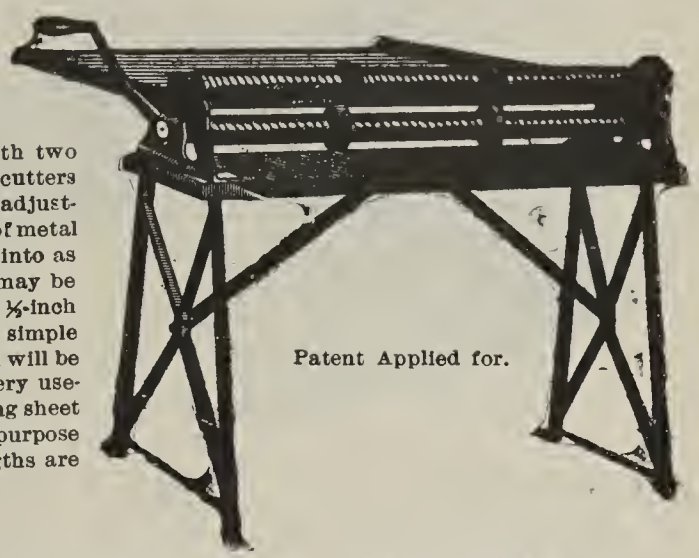
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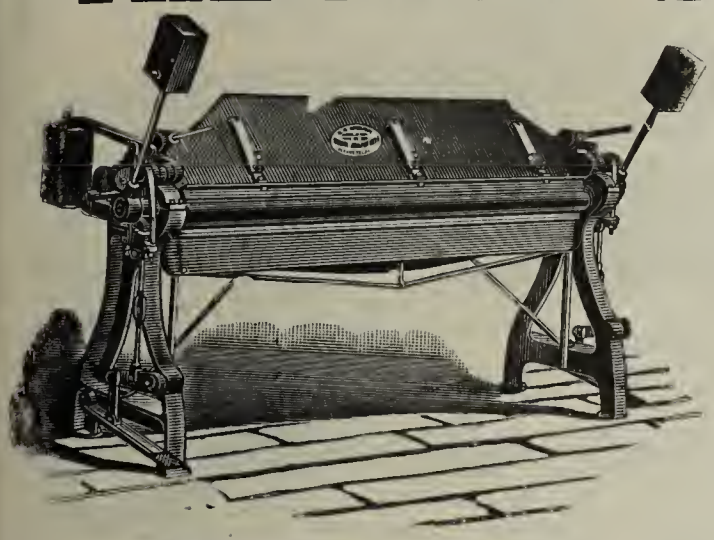
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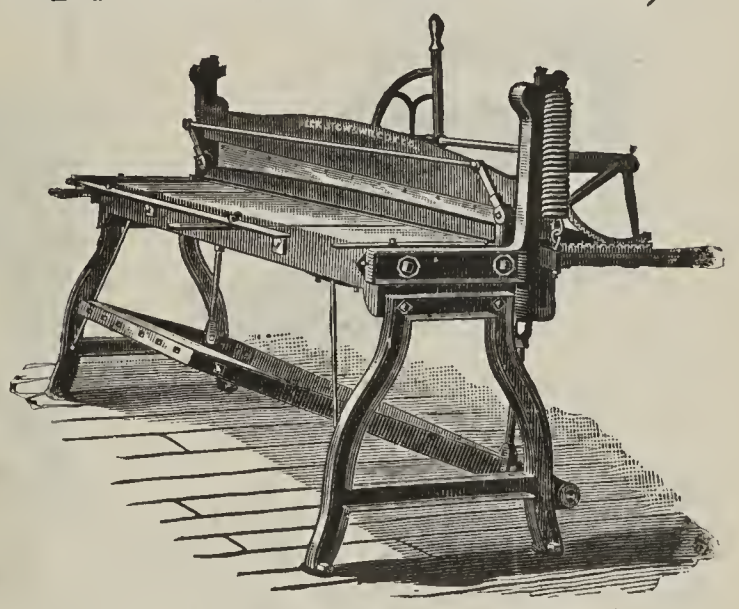
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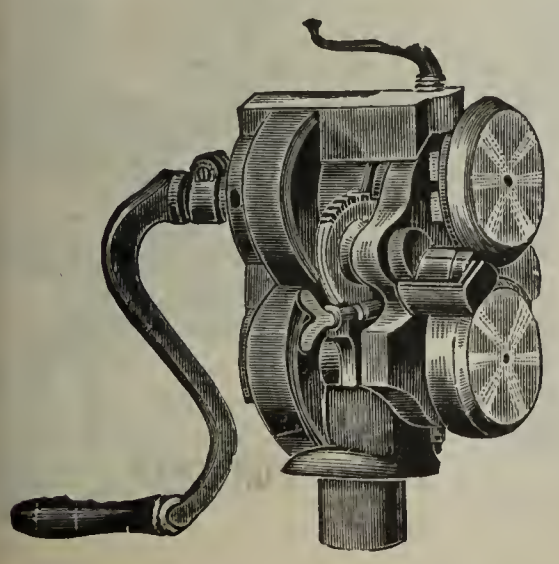
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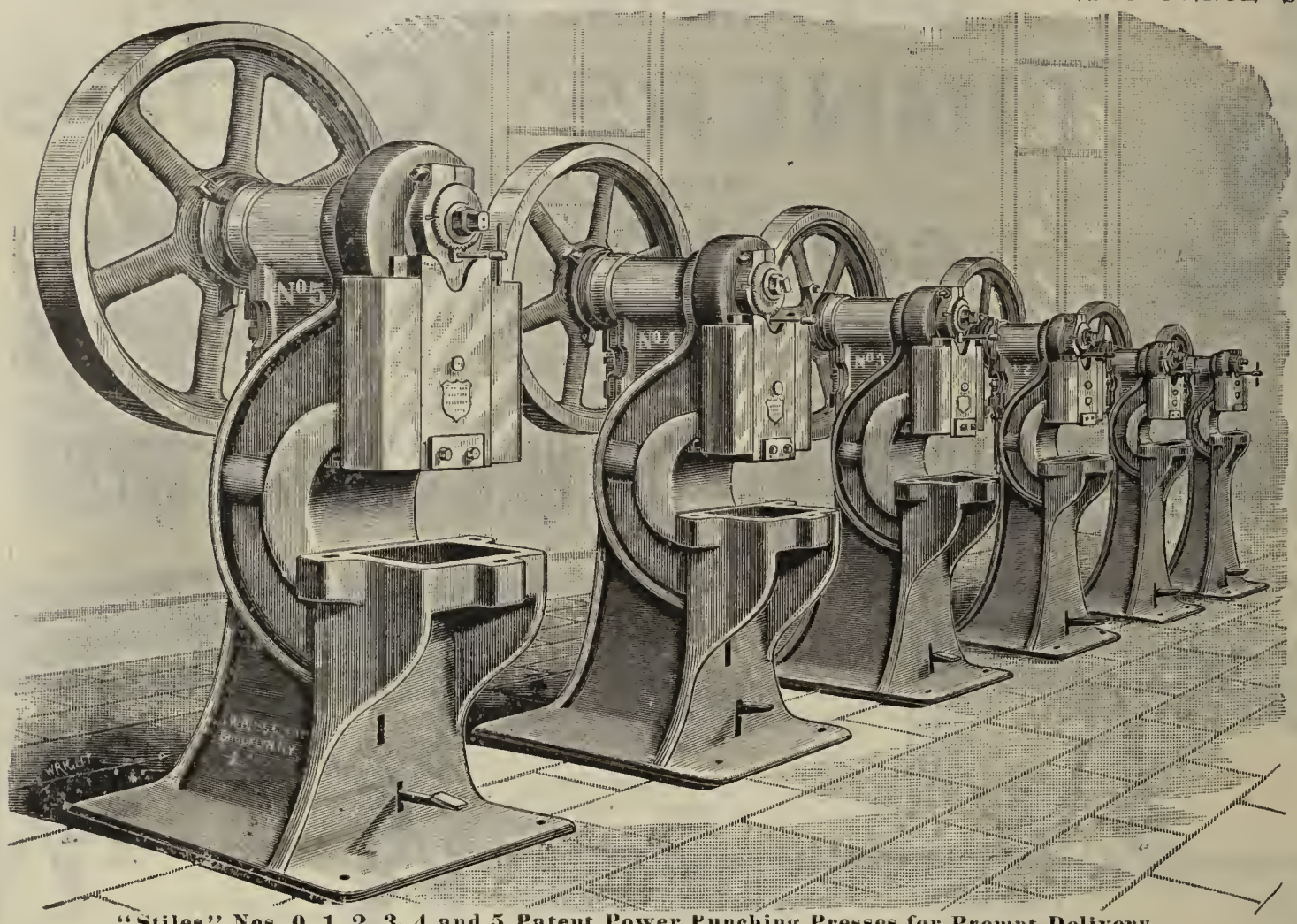
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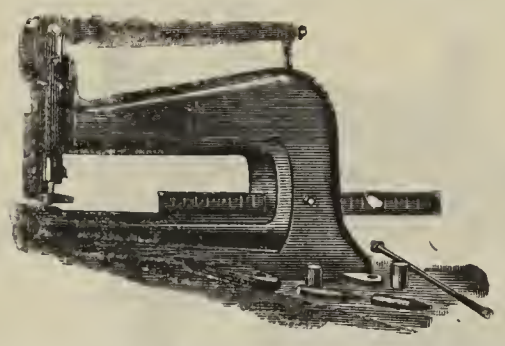
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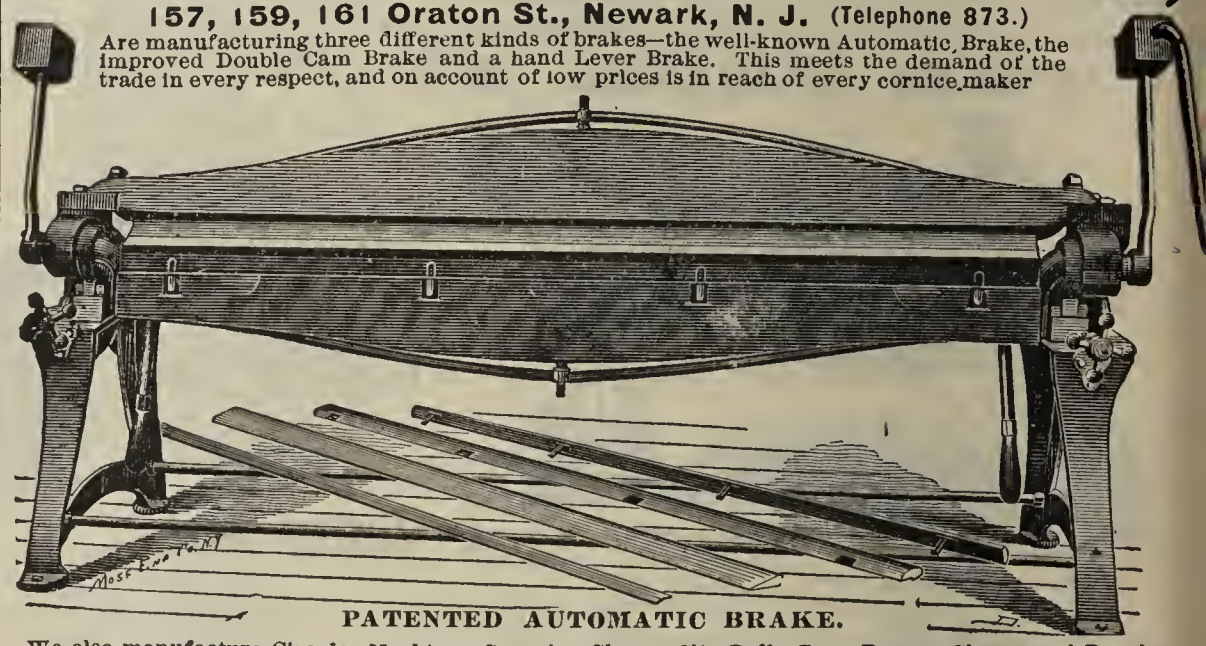
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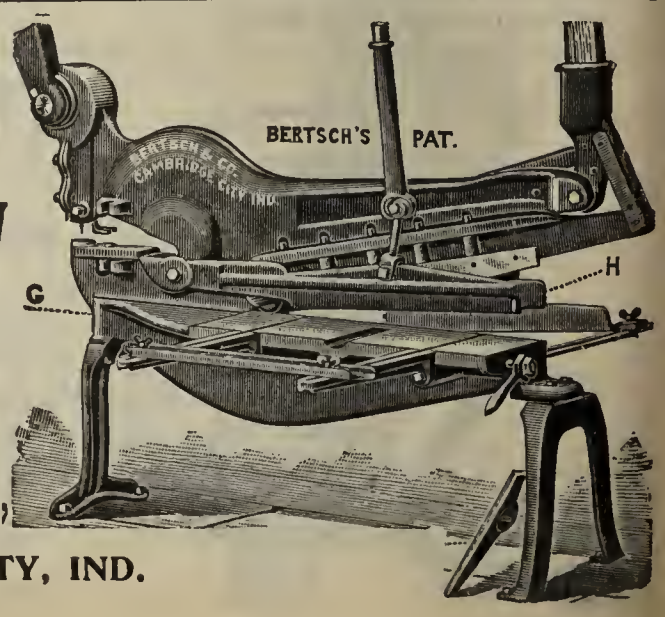
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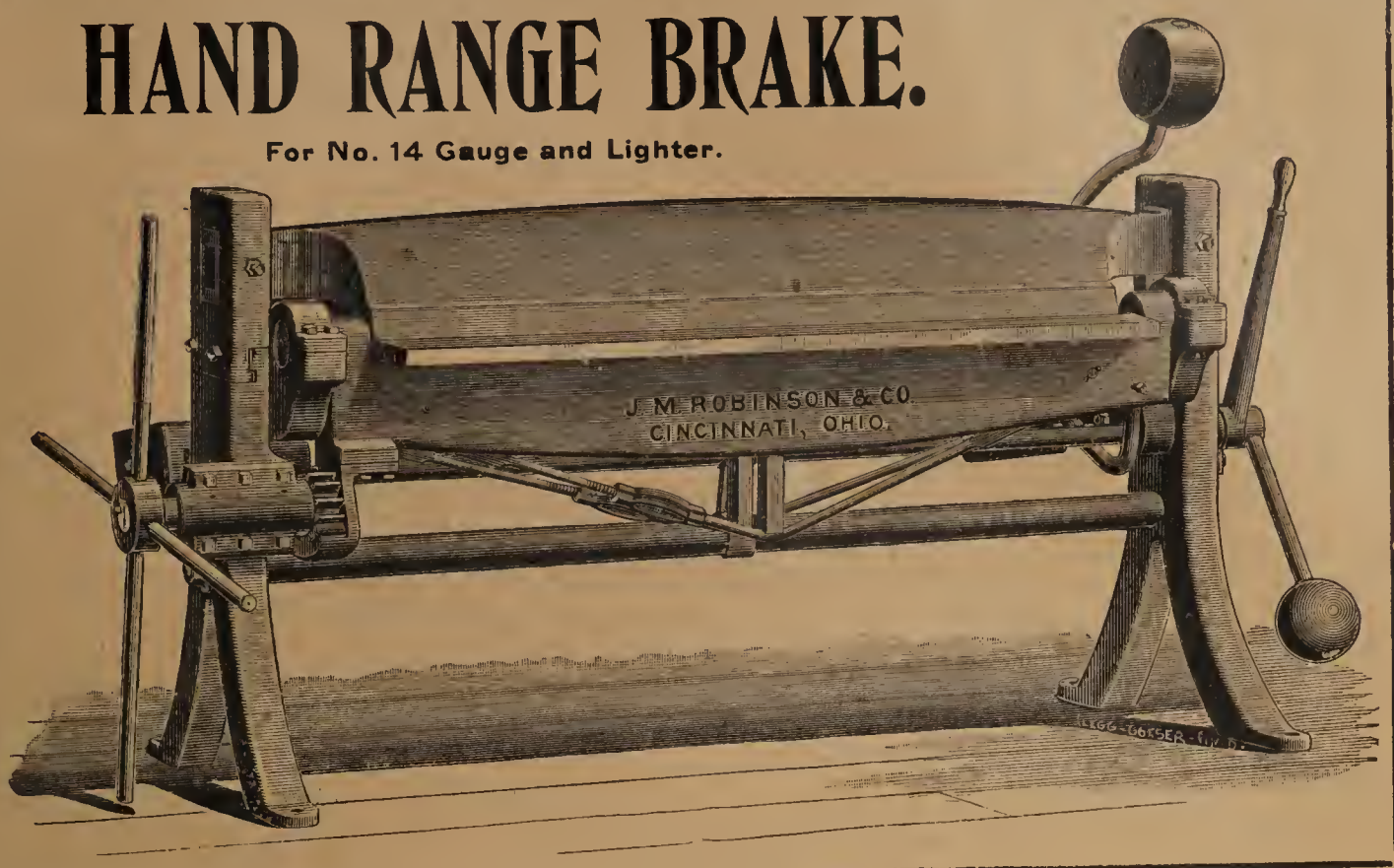
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—The centenarian has once more caused us to marvel. This time, at the age of 101, he has grasped the hand of President McKinley among the northern hills and announced his dim recollection of General Washington when the father of his country visited Albany—although at the time he could not have been more than two years of age. The most interesting confession made by the veteran, however, was that he attributes his long life to bear meat and johnnycake. This is a welcome departure from the tobacco or whisky habit, total abstinence or early rising; and it is to be hoped that all intending centenarians will make a note of it.—*Mail and Express.*

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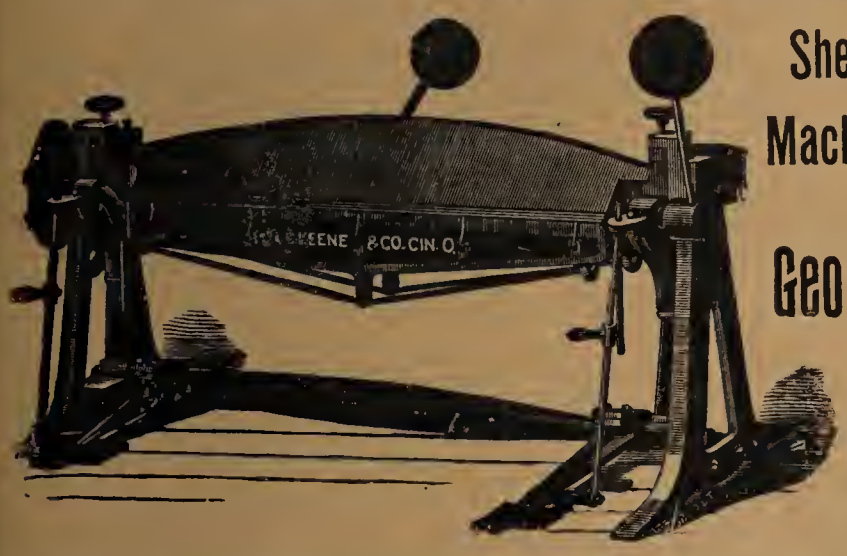
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Painter—Out of my head.

Critic—You must be glad that it is out.—*Exchange.*

—OBEDIENCE.—"How far can you swim, Willie?" inquired the visitor.

"Oh, I don't know," replied Willie.

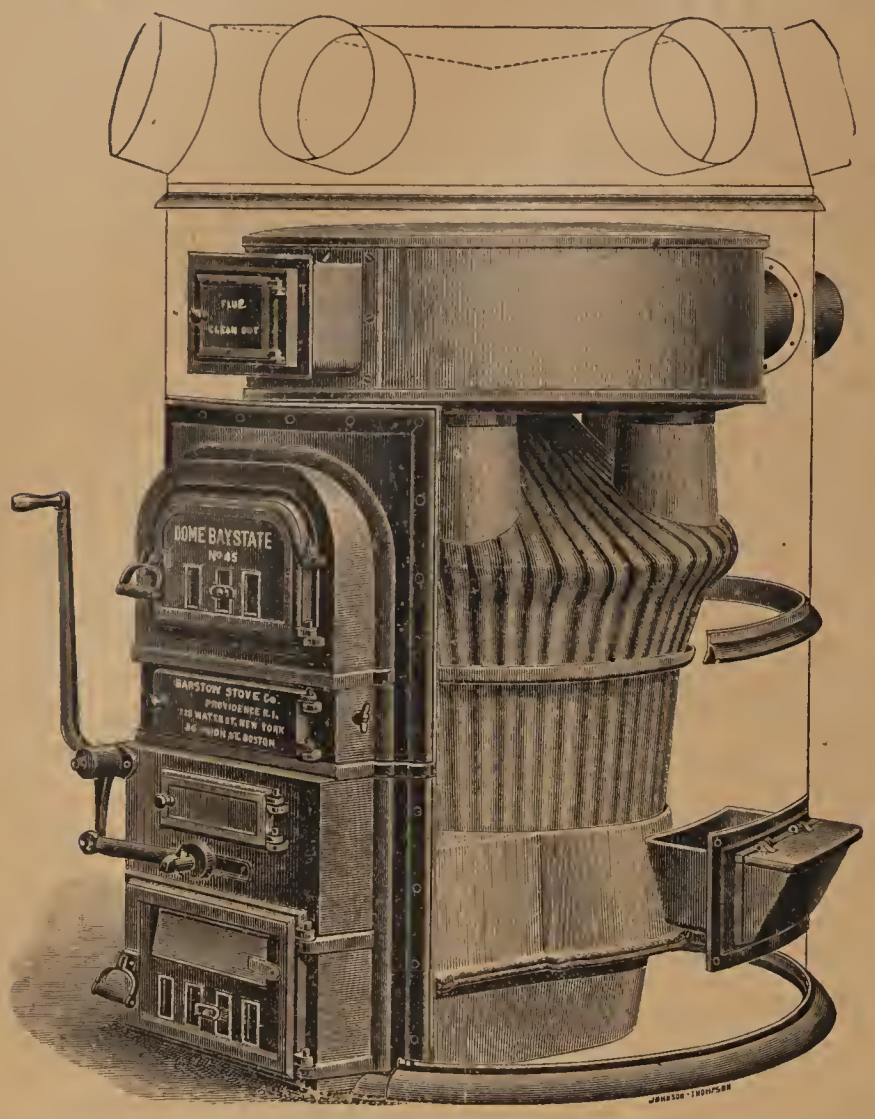
"Across the ocean?" persisted the visitor facetiously.

"I shouldn't wonder," answered Willie promptly.

"Why, Willie, do you know how far it is across the ocean?" demanded Willie's mother.

"Don't care how far it is," retorted Willie. "Pop told me once never to admit that I couldn't do a thing until I'd tried and failed, and I never tried this."

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Diamond Thimbles. S. CHENEY & SON, Manlius, N. Y.

EASTWOOD VALVE.
EASTWOOD WIRE MFG. CO., - Belleville, N. J.

The Bird In Hand.

A good furnace in the cellars of your best customers, put there by you, is worth all the possible and imaginary profits from selling inferior furnaces.

The best furnace to draw the dollars of your customers to you is the Paragon. It is your trade missionary.

ISAAC A. SHEPPARD & CO., Philadelphia and Baltimore.

APOLLO BEST BLOOM GALVANIZED IRON

Our galvanized sheets bear this stencil

VANDERGRIFT APOLLO IRON & STEEL COMPANY BEST BLOOM TRADE MARK PITTSBURGH

We make only one quality and use no other brand as a trade mark

Apollo Iron and Steel Company
Vandergrift Building
Pittsburgh

Open Lavatories.

We offer special lines of Lavatories, with Plain or Decorated Bowls, ranging in price from $10.00 or $12.00 to many times these sums, and we particularly desire correspondence with buyers who wish a serviceable and modern combination at a reasonable price. Inquiries for any description of Tinners' or Plumbers' Supplies will meet with careful consideration.

E. S. WHEELER & CO.,
256 Water St., New Haven, Conn.
New York Store, 194 Front St.
Boston Office, 220 Devonshire St.

HOUSEHOLD RANGES, HEATERS. Send for Catalogue. The White-Warner Co., TAUNTON, MASS.

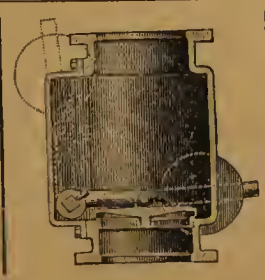
WILLIAMS STOVE LINING CO.,
TAUNTON, MASS., Manufacturers of FIRE BRICK LININGS.

STEAM TRAPS, Pump Governors, Water Seal Automatic Air Valves, Back Pressure Valves, Pressure Regulating Valves, Radiator Valves.
JUDSON A. GOODRICH CO.,
120 BEEKMAN ST., - - NEW YORK.

eam Specialties.

mp Governors, eam Traps, eam and Water ducing Valves. nk Temperature
Noiseless Back Pressure Valves, Water Arches, and Oil Separators. Controller.

IELEY, 9-17 W. 13th St., NEW YORK.



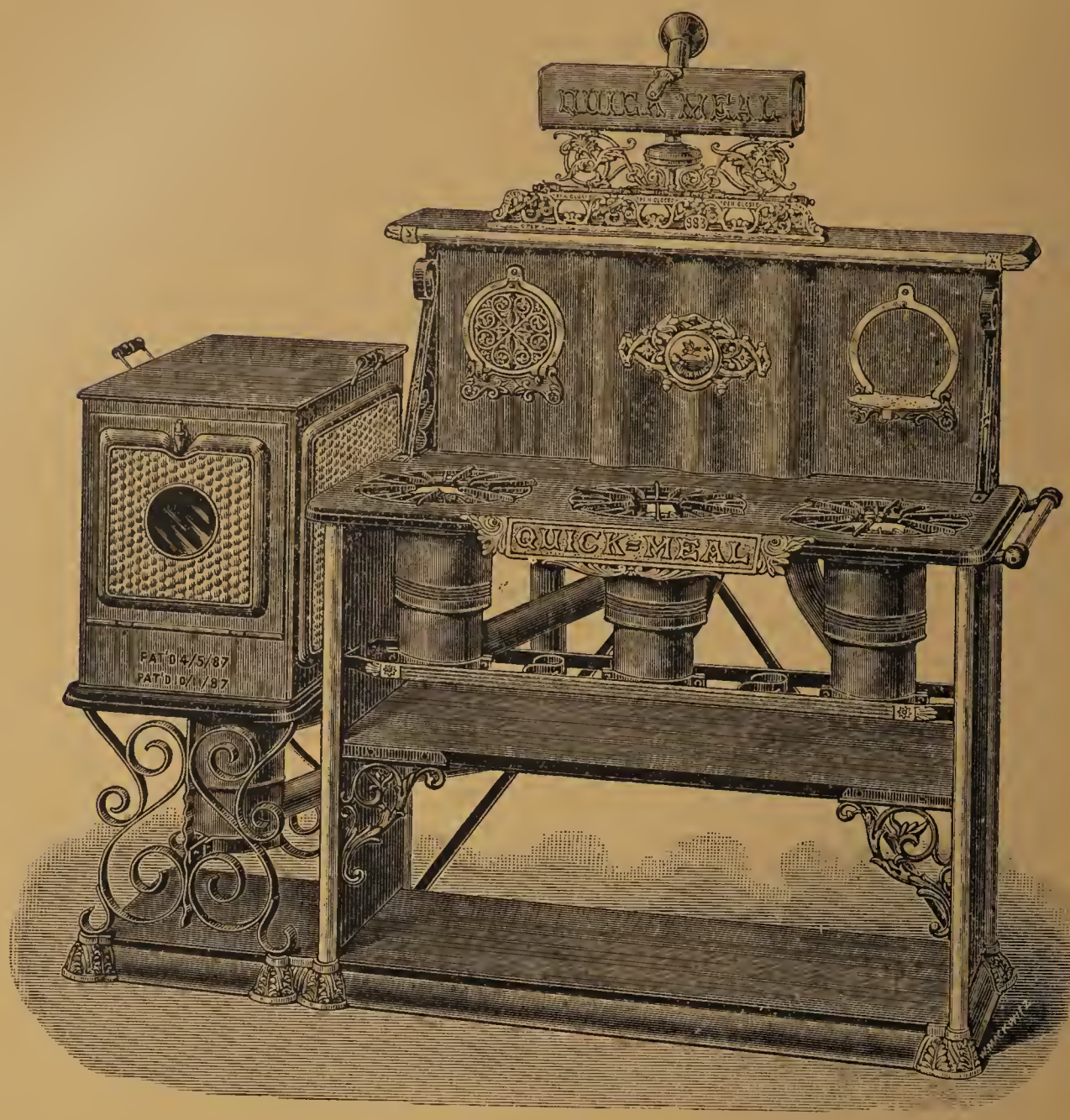
EXCELSIOR STRAIGHT-WAY BACK PRESSURE VALVE

This valve has no dash pots, springs, guides or complicated levers to get out of order. It is simple, reliable and well made. Never sticks, and can be relied upon at all times when using exhaust steam for heating; or when used as a relief, or free exhaust on a condensing plant, it has no equal. It is noiseless and free from any complicated attachments.

JENKINS BROTHERS, New York, Philadelphia, Boston, Chicago.

THE MAGEE CATALOGUE
Shows a complete line of cooking and heating apparatus.
SEND FOR A COPY.
MAGEE FURNACE CO., Boston, Mass.

QUICK MEAL



Some few Dealers are under the impression that hard times are going to last forever, and that as a consequence during the coming season Inferior Stoves, which have held the day during our financial depression, are going to sell to almost the exclusion of Good Stoves. That is not the case. Inferior Stoves have the only advantage of being Cheap—they are absolutely devoid of any other advantage to either dealer or user—and Good Goods are as sure to come to the surface after the storm is over as the sun is sure to reappear after the clouds have passed.

Quick Meal Evaporators are better than ever; they could not be made better at any price; they give absolute satisfaction and a purchaser will never cease thanking the dealer for having sold him the Best; he is likely to be a good customer for a good many years to come. Quick Meal Evaporators make Happy Dealers, Happy Users and Happy Homes.

Ringen Stove Co.

ST. LOUIS.

P. S.—The sale of Quick Meal Steel Ranges has **DOUBLED** during the season. They are not the **CHEAPEST,** but they are the **BEST.**

Carton

Hot Water & Steam Boilers & Furnaces.

This Doctor Repeats the Dose at Regular Intervals.



South Bend, Ind., Feb. 19, 1898.

Messrs. G. E. Meyer & Son:

Dr. Sirs:—I have in use ***seven*** of the ***"CARTON"*** furnaces in my different houses and am pleased to state have given ***perfect satisfaction. Three*** I purchased of you in 1896, and they worked so satisfactorily that I purchased ***four more*** last year. I can particularly recommend them for ***economy of fuel*** and ***ease of management.*** I cannot emphasize too emphatically the ***general satisfaction*** these ***"CARTON"*** heaters have given me.

Yours truly,
C. A. Dougherty, M. D.

Send for our

Furnace Catalogue

and Prices.

1847-1898.

If Interested in Steam and Water Boilers—we make a most complete line, and you should send for our Boiler Catalogue and Prices.

CARTON FURNACE CO.,

Makers of Heating Apparatus for over 50 *Years*,

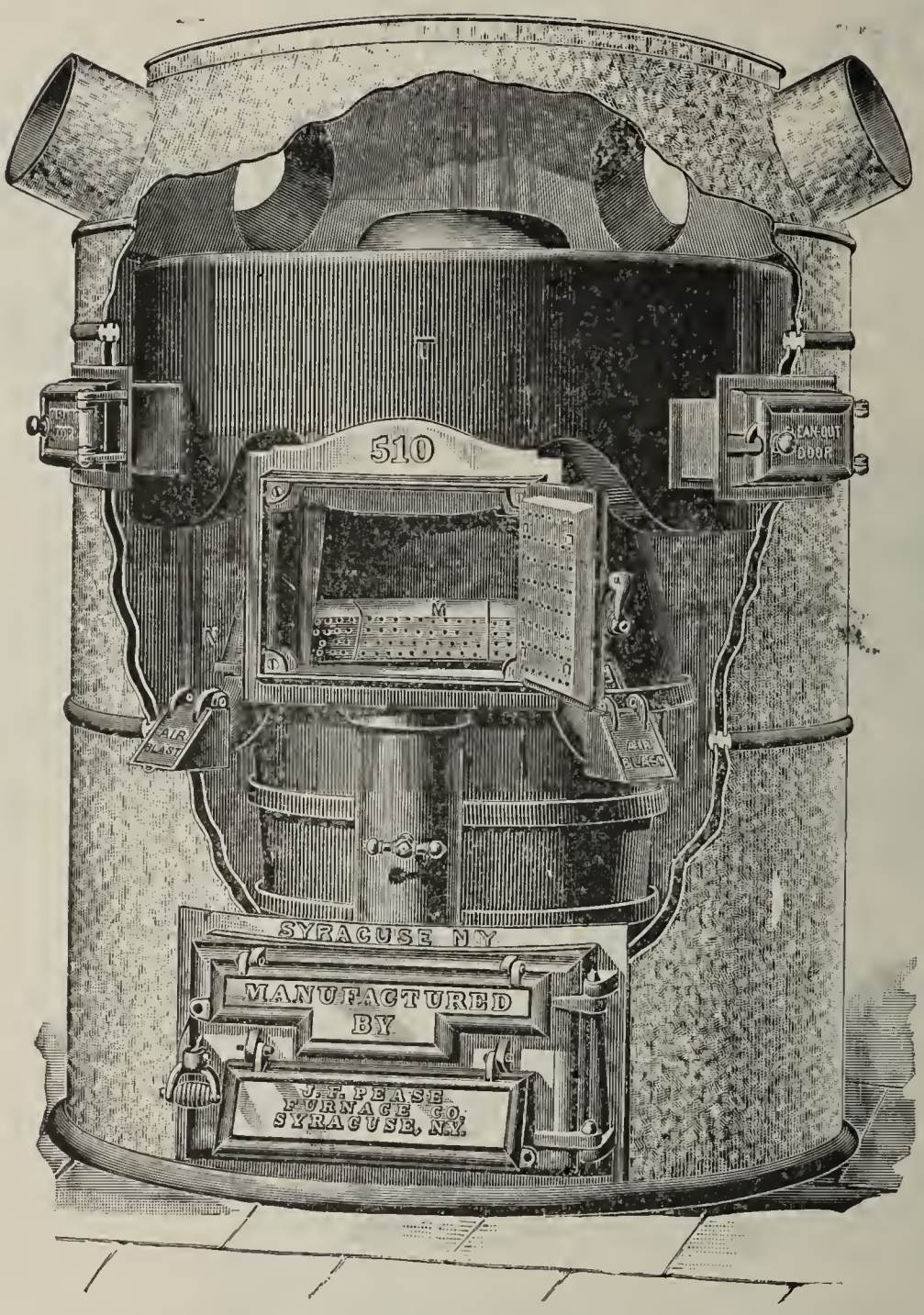
UTICA, N. Y.

J. F. PEASE FURNACE CO.

ECONOMY ECONOMY

PEASE
Air Blast Furnace

SPECIAL SOFT COAL BURNER.



SPECIFICATIONS—All Cast Iron. Low in Stature. Not High Priced. Special Adjustable Air Blast Appliance. Nearly Jointless Construction. Selection from 3 Styles of Grate. COUNTERBALANCE SPRING REGULATOR.

Catalogues illustrating 13 Patterns of Furnaces promptly mailed to the trade.

J. F. Pease Furnace Co.,

MANFRS. OF
Furnaces, Combination, Steam and Water Heaters.

SYRACUSE, N. Y.
86 East Lake St., Chicago.

SYRACUSE, N.Y.



RUSSEL WHEELER & SON
Wheeler
TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.

We have heaters adapted to all sections of the country and for all kinds of fuel—Hard or Soft Coal, Coke or Natural Gas, etc.

Tell us your needs and we will do our best to fit you out.

Only recently a man in the West Indies wanted of us a furnace to burn dried cocoanut husks.

THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,
REAL ESTATE,
HATBORO, PA.

TUESDAY AND FRIDAY,
221 SOUTH FIFTH STREET,
PHILADELPHIA.

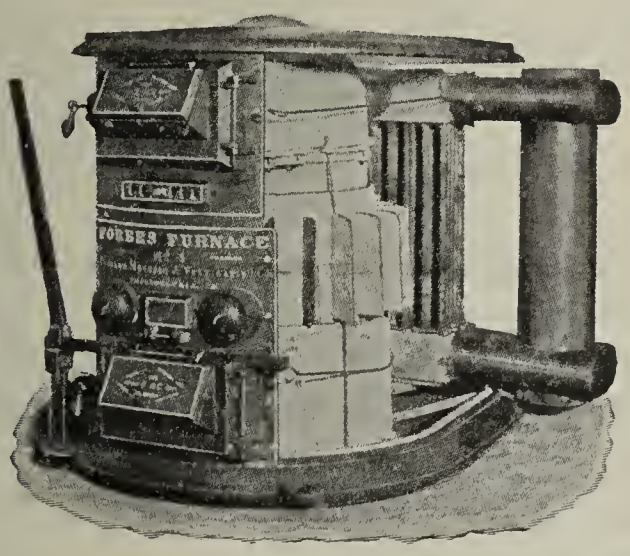
HATBORO, PA., Dec. 26th, 1896.

MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.

MY DEAR SIR :

In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal. Very truly, I. N. EVANS.

SEND FOR CATALOGUE



COLD SMOKE-PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

Only 4 feet 3 inches high in the Largest Sizes.

. . . LOW PRICE . . .

TUBULAR HEATING AND VENTILATING COMPANY,

228 QUARRY STREET, PHILADELPHIA.

DO NOT SPECULATE

IN

Cheap or Experimental

LINES OF

Vapor or Oil Cooking Stoves.



The average mortal has troubles enough of his own without buying those of his neighbor.

Speculation in any of the above mentioned lines will drain your purse and put you to a world of trouble.

Seeds of prudence now well sown in the selection of a line that is both complete and honest will yield a profitable and happy harvest. A good beginning for 1898 means half the battle won.

If you are interested in the handsomest line made, write for our catalogue.

EXCLUSIVE AGENCIES GIVEN.

THE SCHNEIDER & TRENKAMP CO.,

CHICAGO, ILLINOIS. CLEVELAND, OHIO.

Monarch Line



"New Method,"
"Smokeless Giant Generator,"
"Smokeless Safety Junior,"
"Blue Flame Oil,"
"Asbestos Filled Oven,"

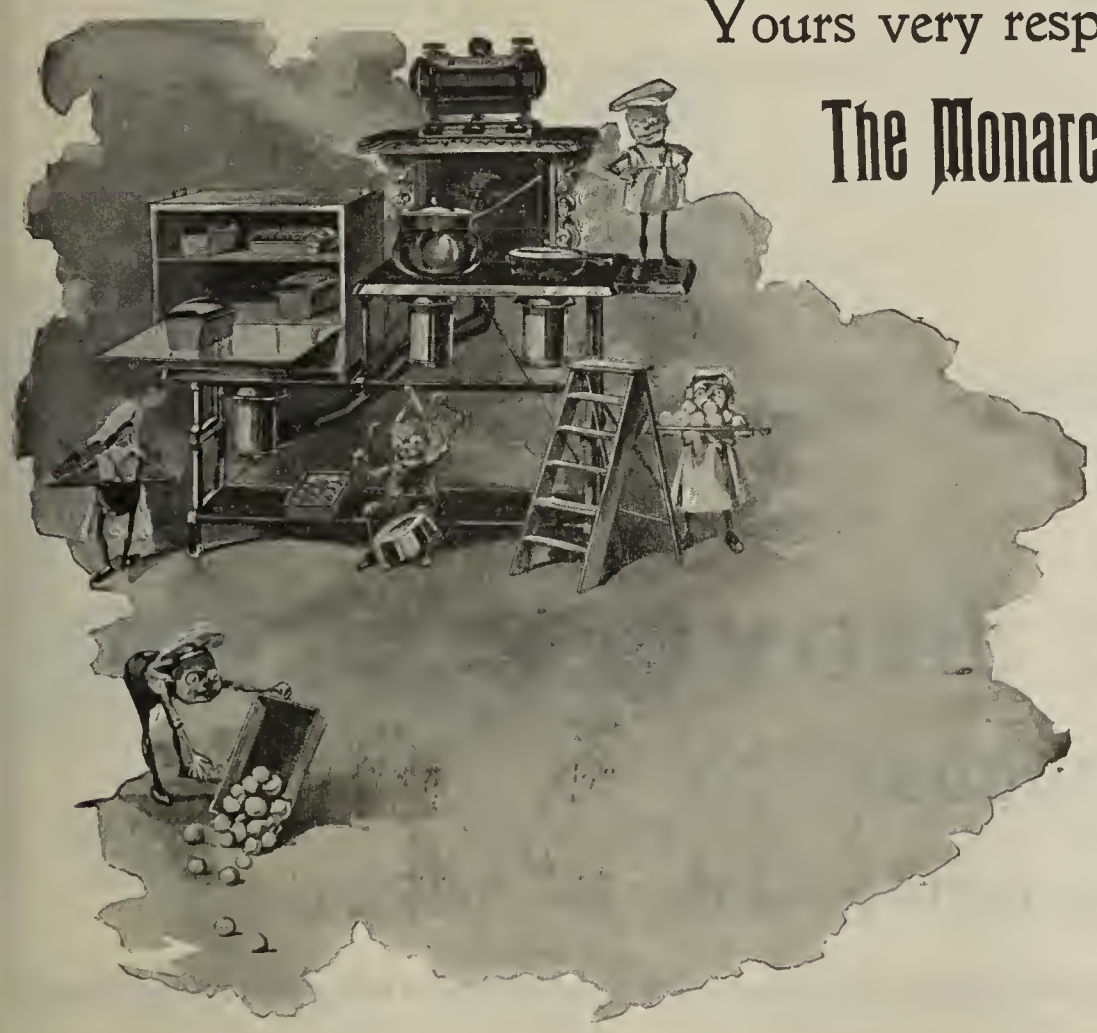
FOR 1898,

as our Trade-Mark symbolizes, is emphatically the embodiment of PROGRESS. It enters its eighteenth year of public service with the positive assurance that it has reached the high water mark of progressive development. We have made it our constant aim to incorporate into every pattern we make some original feature that will afford the pushing and live merchant an opportunity to build up a reputation for *High-Class Goods*, and to reap a profitable trade from their sale.

A most critical examination of every article we show will convince you, Mr. Stove Dealer, that "the *MONARCH* line is all right."

We will be glad to submit a line of samples for your inspection.

Yours very respectfully,



The Monarch Stove and Mfg. Company,

MANSFIELD, O.

Get our BEAUTIFUL NEW CATALOGUE and read all about them.

BRANCH HOUSES:

67 Lake St., Chicago.
284 Pearl St., New York City.
107 N. Second St., Philadelphia.
954 Penn Ave., Pittsburgh, Pa.
191 Eagle St., St. Paul, Minn.
12 W. 10th St., Kansas City, Mo.
Lincoln, Neb.
H. Leonard & Sons, Grand Rapids, Mich.
Kiechle, Brentano & Co., Evansville, Ind.

WELCOME

Stoves and Ranges



Already Famous.

New Magic Welcome Range.

Beans: We bake them nicely browned, Boston style.

Potatoes: With their jackets on to suit an epicure.

Bread: That charms and delights the new wife. No complaints or comparisons by the contented husband.

Cakes and Pastry: So quickly that our visitor says, "You are a magician." We answer, "Oh, no; we use a Magic Welcome Range."

Staff of Life: Every dealer who wants bread winners please write. Our prices and terms are the best.

Syracuse Stove Works,

Syracuse, N. Y.

Branch Office---No. 105 Beekman St., New York City.

BLUE FLAME OIL STOVE LEADERS

FOR 1898.

WE LEAD AND OTHERS FOLLOW.



For Durability and Simplicity our Blue Flame Wick and Wickless Stoves are recognized as the best in the market.



WICKLESS.

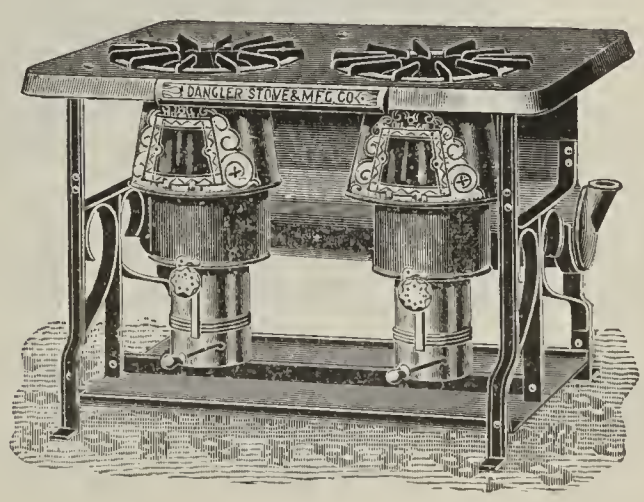
Made in seven different styles. Convenient in construction ; economical in the consumption of oil ; made with our Double Feed ; German Silver points ; no rusting or clogging ; with valve-stop and regulator ; heavy brass chimneys. Made for service and not for show. High back swinging shelf ; removable tank ; stove on rollers ; easy to operate and to clean.

A STOVE FOR THE PEOPLE.

WICK.

Our celebrated Blue Flame Wick Stoves are made in seven different styles, and are now in use in more than fifty thousand households in the United States, who bear willing testimony to their great merits. Artistic in design, handsome in appearance, and powerful in operation.





Our line of Gasoline, Vapor and Evaporating Ranges, Stoves, etc., as usual, is perfect and complete. Send for Catalogue.

THE DANGLER STOVE & MFG. CO., - Cleveland, Ohio.

The "Wickless" Blue Flame Oil Stove

IS ALL SUMMED UP IN THREE WORDS:

SIMPLE, SAFE, EFFICIENT.

No generating Gas, simply apply the match to the oil (common kerosene) and it produces a Smokeless Blue Flame.

THOUSANDS ALREADY IN USE.



The "Wickless" Blue Flame Oil Stove, made in 10 styles and sizes, will meet the requirements of any cook stove.

DON'T SHUT YOUR EYES IN BUYING.

Compare our "Wickless" with any other Oil Stove and we are sure of your order.

WRITE FOR CATALOGUE AND ORDER SAMPLES.

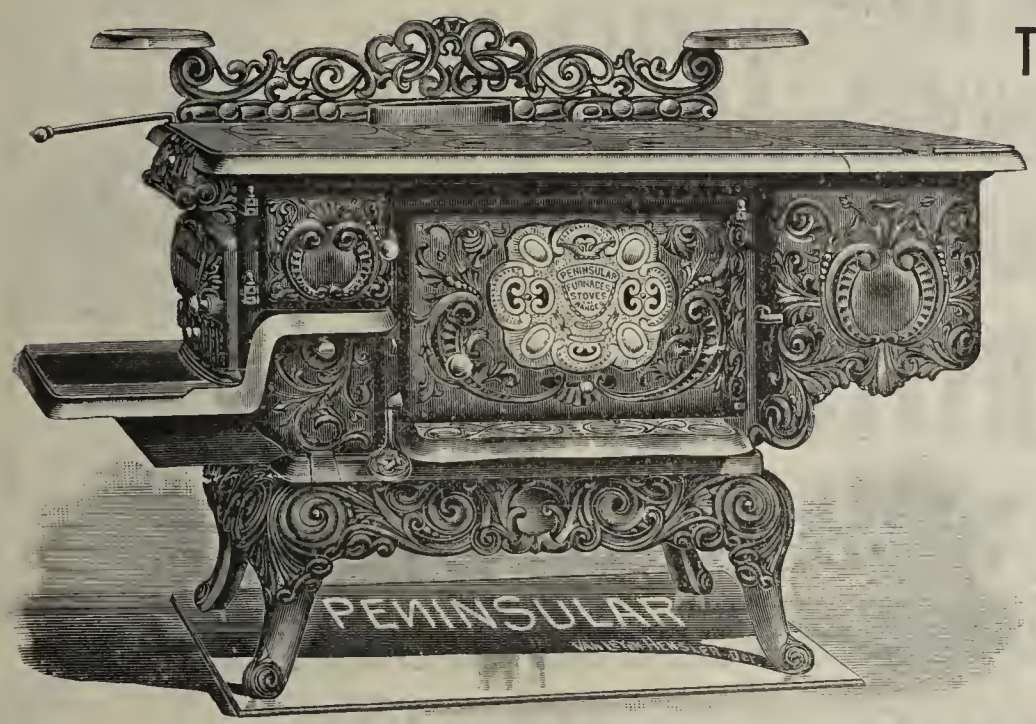
THE STANDARD LIGHTING CO., - Cleveland, Ohio.

PENINSULAR

STEEL OVEN COOKS and RANGES

YIELD LARGE PROFITS

Because They Cost No More Than Ordinary Constructions And Have No Competition.



The GRANITE PENINSULAR.

Six Hole, Steel Oven Coal and Wood Range,

WITH INTERCHANGEABLE KEY PLATE TOP.

MADE IN

16, 18, 19 and 21 inch Ovens,

Square and Flush Reservoir,

WITH

7, 8 or 9 inch Top.

ASK FOR CATALOGUE.

The WARRANTY PENINSULAR.

STEEL OVEN COAL AND WOOD COOK,

MADE IN

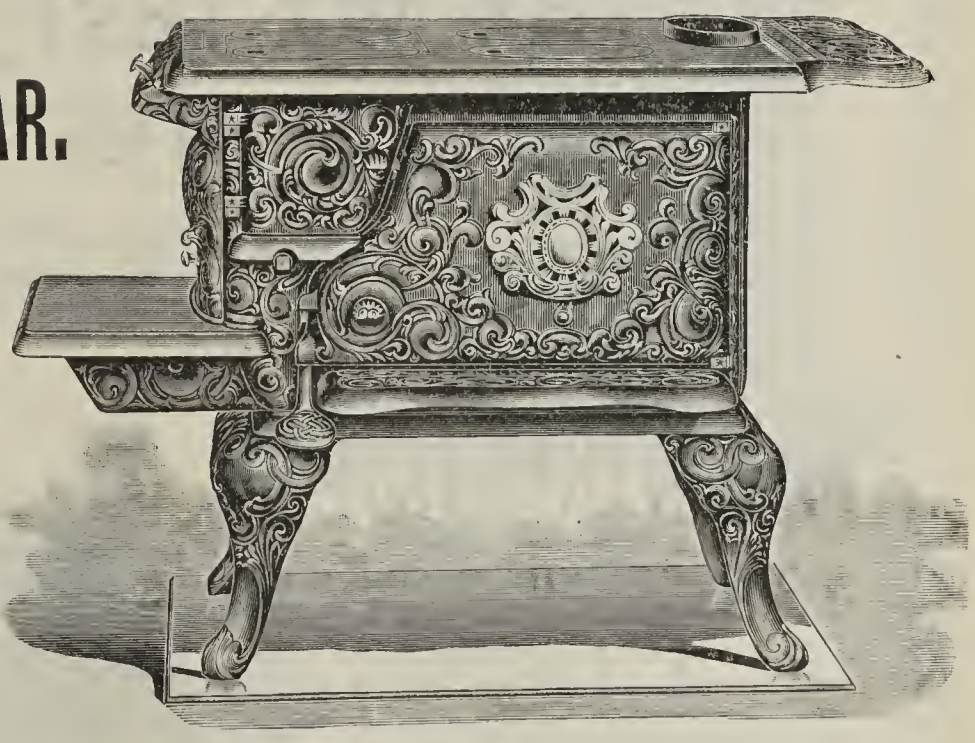
Square and Flush Reservoir,

With 17 and 19 inch Ovens,

AND

7, 8 and 9 inch Top.

ASK FOR CATALOGUE.



WE GIVE A GUARANTEE BOND WITH EACH

YOU RUN NO RISK.

"PENINSULAR" FURNACES STOVES AND RANGES WARRANTED "THE BEST"

The Peninsular Stove Company,

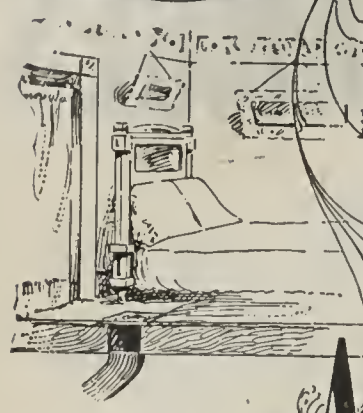
Leading Stove, Steel Range and Furnace Manufacturers,

Detroit. Chicago. Buffalo. Hartford, Conn.

"PENINSULAR" FURNACES STOVES AND RANGES WARRANTED "THE BEST"

HART & CROUSE CO.

Royal Heaters.



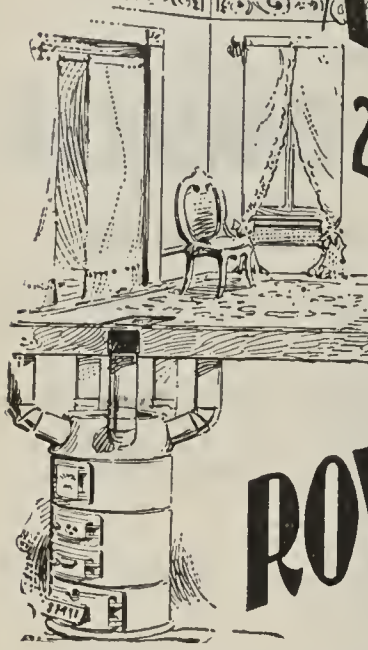


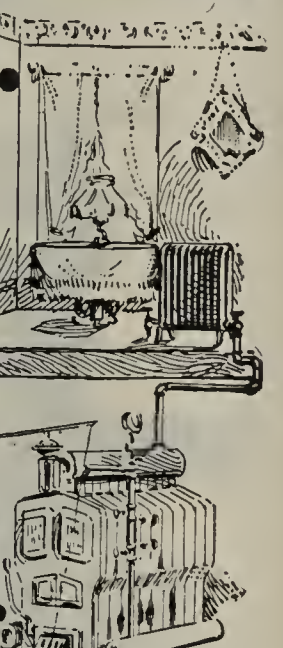
ALL KINDS OF HEATING APPARATUS.

235 WATER ST., NEW YORK. UTICA, N.Y.

79 LAKE ST., CHICAGO. COLUMBUS, O.

ST. LOUIS, MO.





ROYAL HEATERS LEAD ALL OTHERS.

SOLD ON THEIR MERITS, NOT ON THEIR ANTIQUITY.

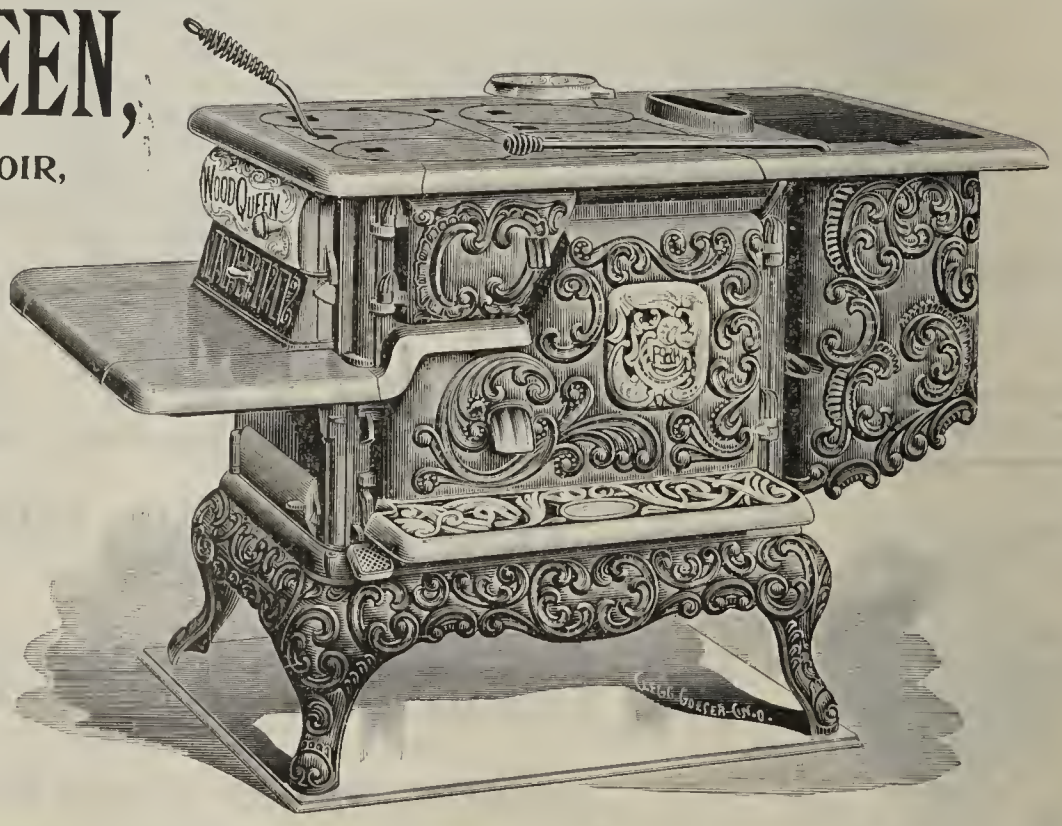
THE MOSTEST GOODS FOR THE LEASTEST MONEY. . .

The Stove is "all right" and we can prove it to you by sending you a sample. It is ***"Lansing"*** the trade of our contemporaries and orders are pouring into the ***"Grand Haven,"*** where we take care of them promptly.

THE WOOD QUEEN,

WITH BRACKET RESERVOIR,

is a great big well made wood stove that is beautiful in design and modern in every respect. We have the first time to place a sample that has not brought in a nice order. Send for prices and secure the agency for your town.



The Portsmouth Stove & Range Co.,

Busiest makers of Stoves and Ranges in the world,

Portsmouth, Ohio.

Gurney

HOT WATER HEATERS and STEAM BOILERS have proved themselves to be eminently satisfactory to the Trade and Fitter, in general, wherever used.

It shows a ***Bright Idea*** on the part of the fitter when he recommends the use of Gurney Boilers, as he knows they will stand up to their ratings and do all that we claim they will.

SEND FOR LATEST TRADE CATALOGUE.

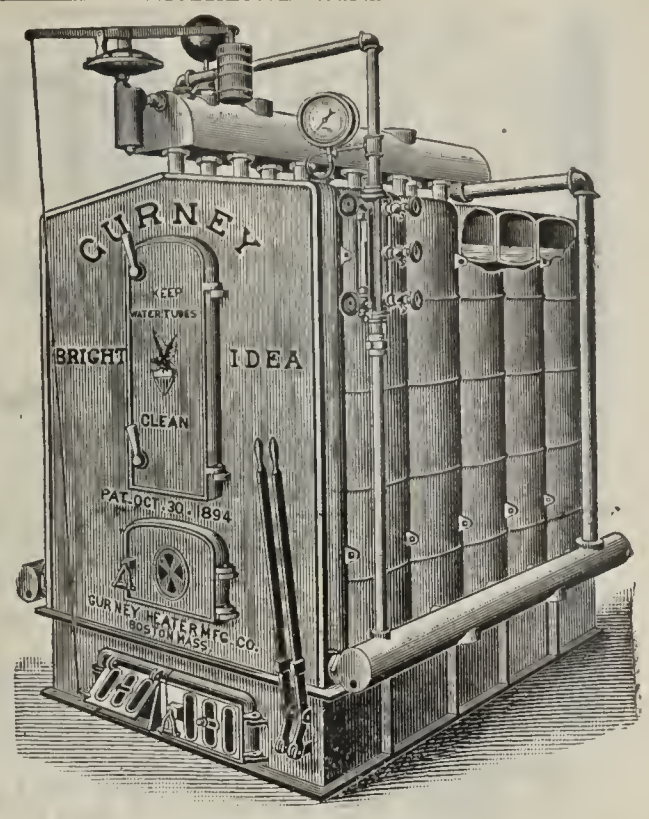
SOLD THROUGH THE TRADE.

GURNEY HEATER MFG CO.,

74 Franklin Street, Cor. Arch,

BOSTON, MASS.

New York Branch:
48 CENTRE STREET.



"BRIGHT IDEA"
Safety Water Tube Steam Boiler.

KEEP YOUR I ON

The Plummer Heaters.

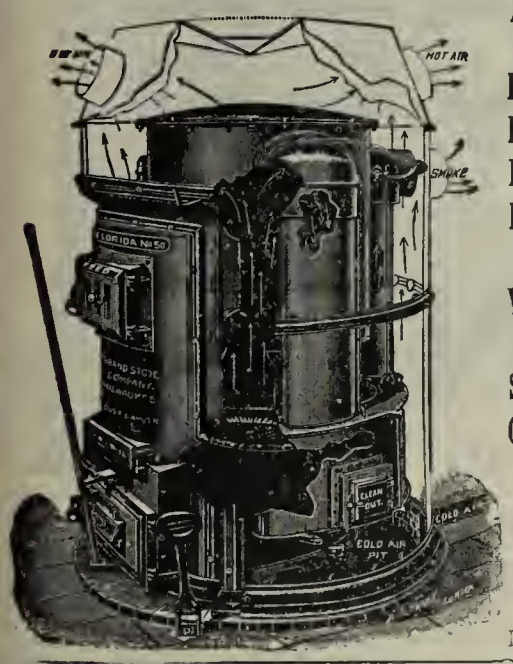
THE PLUMMER BRICK SET **STEAM HEATER,** NEW MODEL.

THE **LEADER** HOT WATER HEATER.

Made in our own plant. Send for Catalogue.

THE PUTNAM FOUNDRY & MACHINE CO., - Putnam, Conn.

THE FAMOUS FLORIDA.
FOR COAL.



Brand's Famous Furnaces.

Revertible Flues.
Extra Large Radiator.
Heavy Fire Pot.
Revolving or Flat Grates.
Very Large Ash Pit Door.
Spacious Ash Pit.
Gas and Dust Proof.
Efficiency in Heating.
Large Radiating Surface.
Easy Access to Radiator.
Durability Unsurpassed
Made in 3 Sizes.
38-50-60 Inch Fire Boxes.

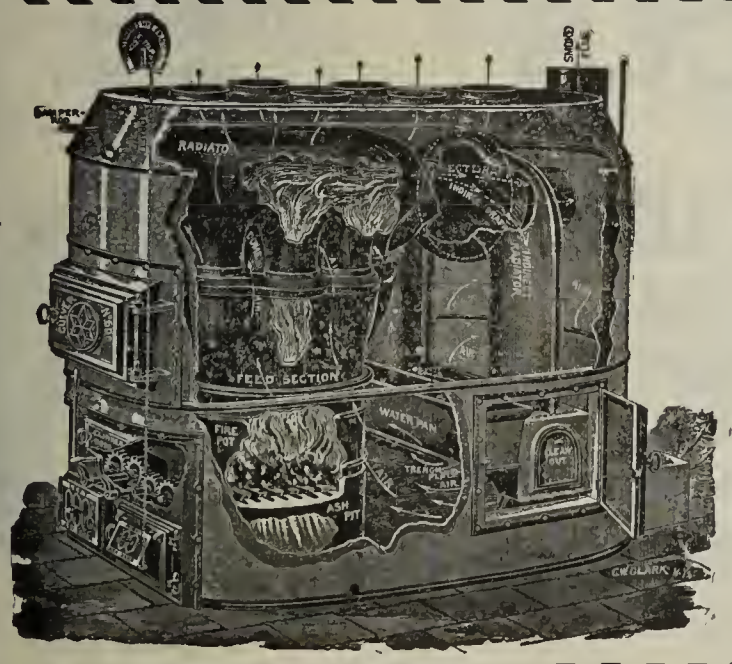
WRITE FOR CATALOGUE.

BRAND STOVE CO.,

MILWAUKEE. CHICAGO.

THE FAMOUS MAGNET.
FOR WOOD.





THE SIMONDS FURNACE CO.,

SUCCESSORS TO THE SIMONDS MANUFACTURING CO.,

No. 50 CLIFF ST., NEW YORK,

Manufacturers of the Celebrated

"CULVER AND MONTANA FURNACES."

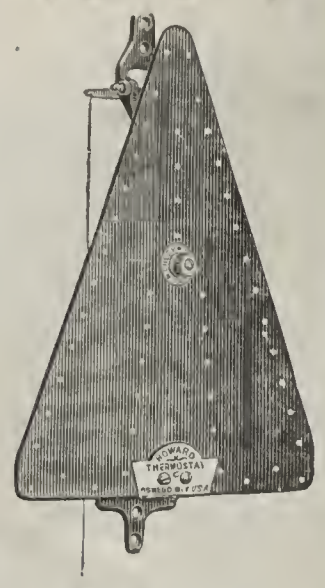
Double and Single Oven Ranges, with special features and latest designs.

STEAM AND HOT WATER BOILERS.

Our new Elliptic Furnace has unequaled radiating surface and is sure to give satisfaction.

Send for Catalogues and Prices.

THE THERMOSTAT,
A SENSITIVE PLATE.



TO HEATER DRAFTS OVER PULLEYS.

HOWARD

Automatic
DRAFT REGULATOR
Consists of a
Plate, Damper and Pulleys.

The *DAMPER* is operated uniformly with the changes in temperature and not opened and closed suddenly. The movement and power is obtained directly from the *PLATE*. From a normal position to wide open or closed, the change is but

ONE DEGREE.

PRICE IS POPULAR.

GET POSTED.

Regulates
Furnaces and Boilers.

YOU should use it. *WHY?* It saves labor and worry about heater; gives nice heat; prevents danger from overheat, and

SAVES COAL.

MADE BY

HOWARD THERMOSTAT CO.,

OSWEGO, N. Y.

1/4 Off
LABOR,
WORRY,
BAD HEAT,
DANGER,
COAL.

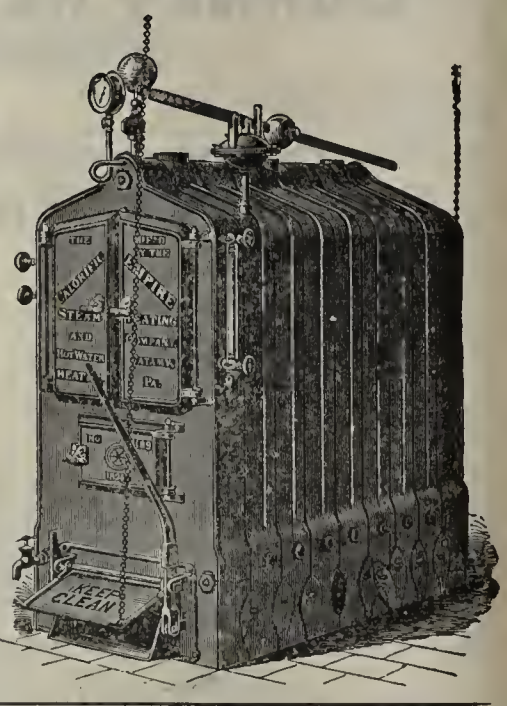


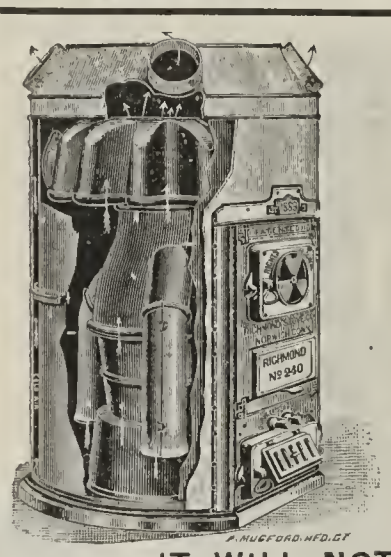
THE Calorific AND Calorific, Jr.,
Steam and Hot Water Heaters,
Manufactured by the
EMPIRE HEATING CO., TATAMY, PA.

For low pressure steam and hot water heating they have no superior. More good points than any other heater on the market. Exeellent heating surfacc, the best grate arrangement out. It is economical, durable and convenient. Made in a large variety of sizes, suitable for all purposes. From the smallest to the largest job. Write for illustrated catalogue and prices and discount to . . . .

JAMES WALP, Gen'l Manager,
675 Northampton St., *EASTON, PA.*

CASSADY & SHAY,
New York Sales Agents, 509 W. 26th STREET.

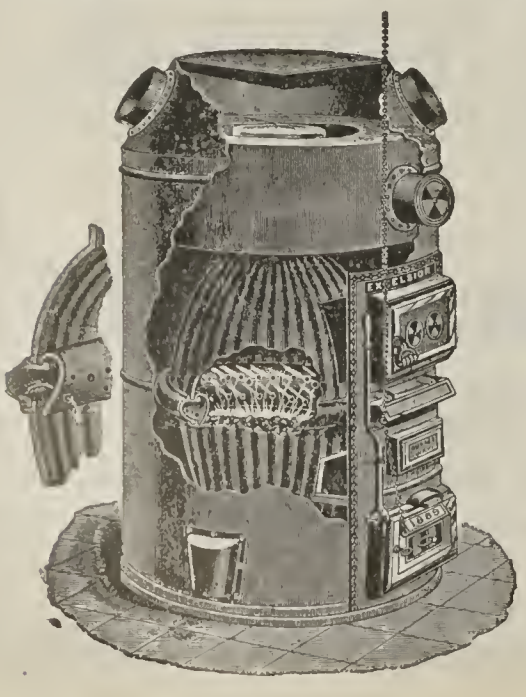




FURNACES TO BURN
Hard Coal, Soft Coal, Wood, Gas.

IT WILL NOT COST YOU ANYTHING TO GET OUR CATALOGUE AND PRICES.

THE RICHMOND STOVE COMPANY,
New York, 85 Centre Street. NORWICH, CONN.



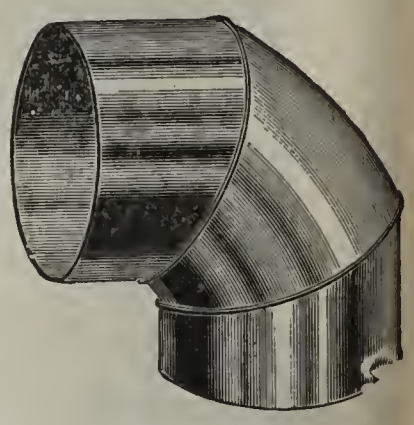
FURNACES
AND
FITTINGS.

ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
AT ATTRACTIVE PRICES.

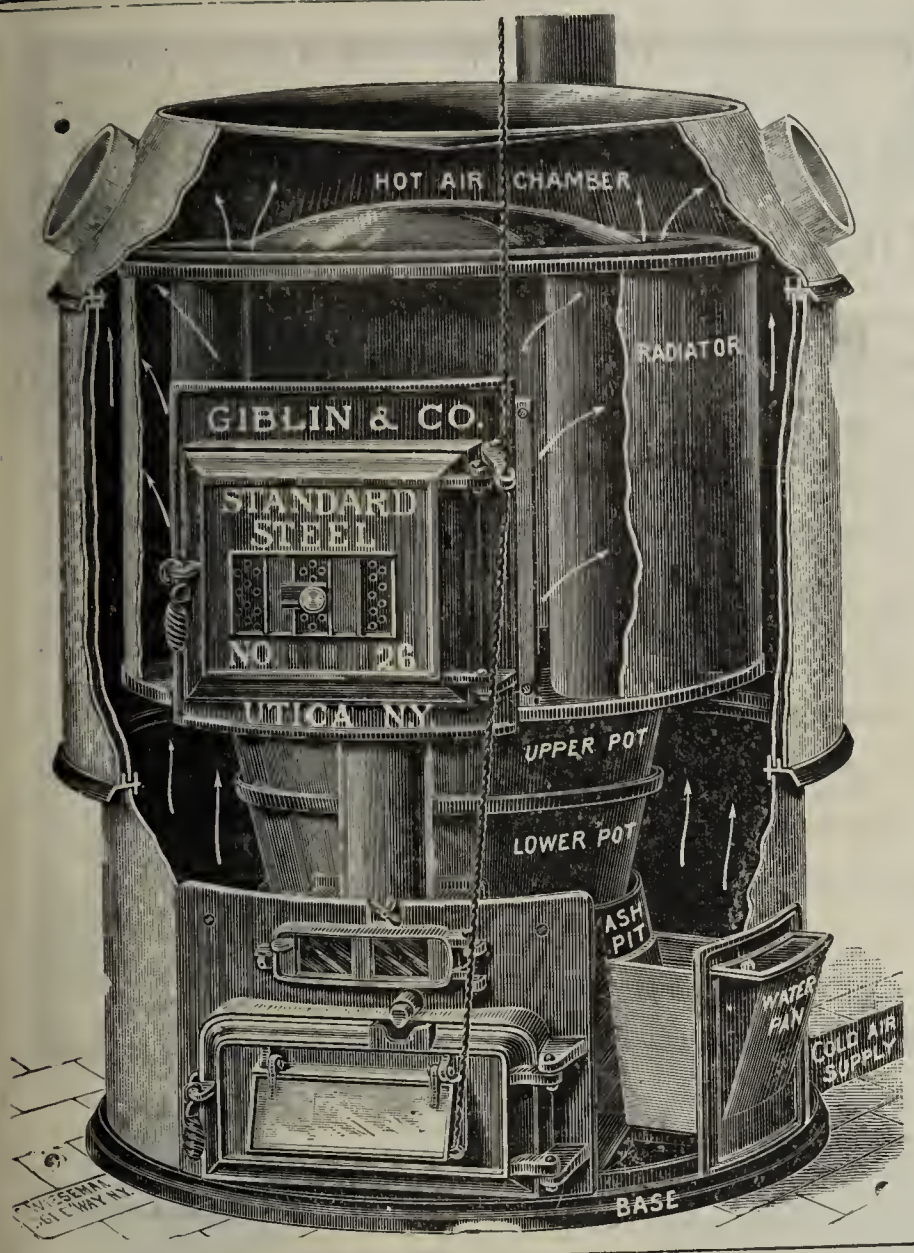
THE EXCELSIOR STEEL FURNACE CO.,
38 W. MONROE ST., CHICAGO.

See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



of Furnace Pipes and Fittings.



WHEN YOU HEAR A MAN

complaining that his family is suffering from cold because the furnace doesn't heat, you can be certain that the furnace in that house is not the STANDARD STEEL.

WHEN YOU HEAR A MAN

complaining about extravagant coal bills. in order to keep warm, inquire and you will find he is not using the STANDARD STEEL FURNACE.

WHEN YOU HEAR A MAN

saying he is compelled to go out doors to get fresh air and escape the gases coming through the registers, you can be certain that he is not using a STANDARD STEEL FURNACE.

WHEN YOU HEAR A MAN

possessing that "tired feeling" resulting from frequent shoveling of coal, managing drafts, frequent excursions to the cellar during night and day, ask him and you will find he is not using a STANDARD STEEL FURNACE.

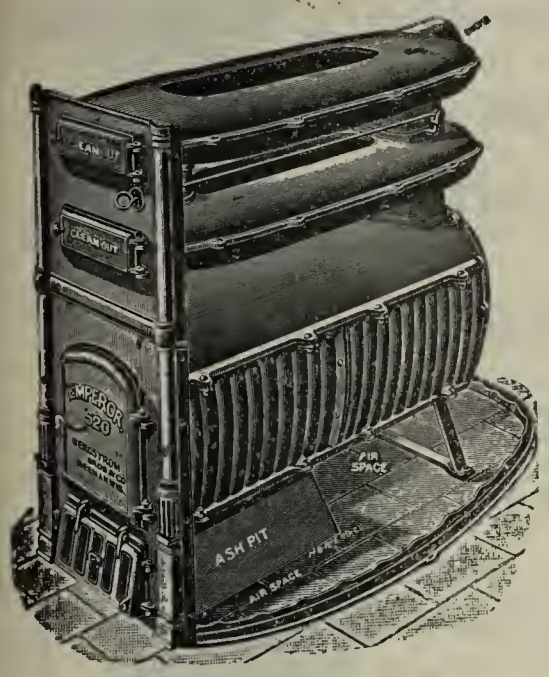
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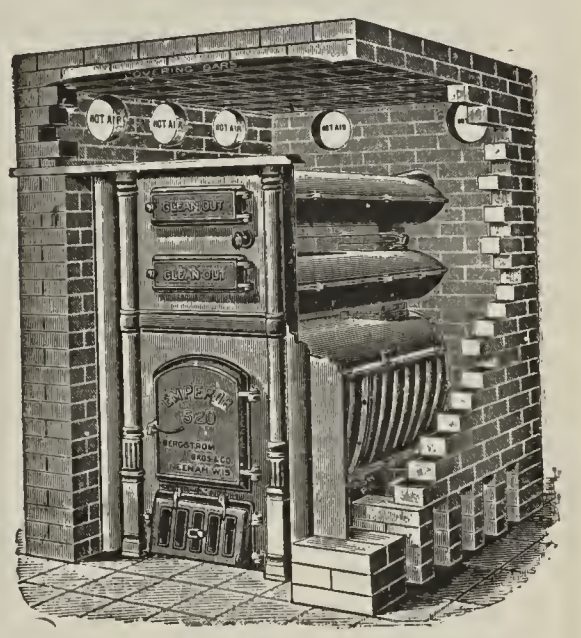
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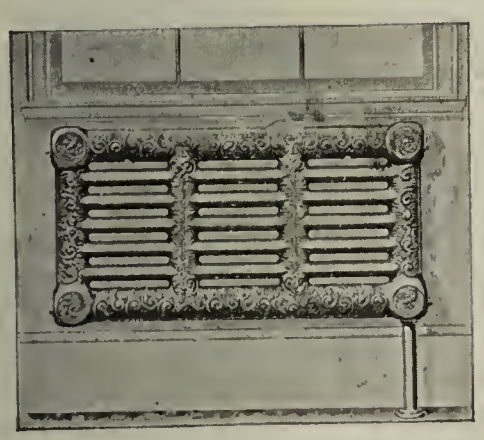
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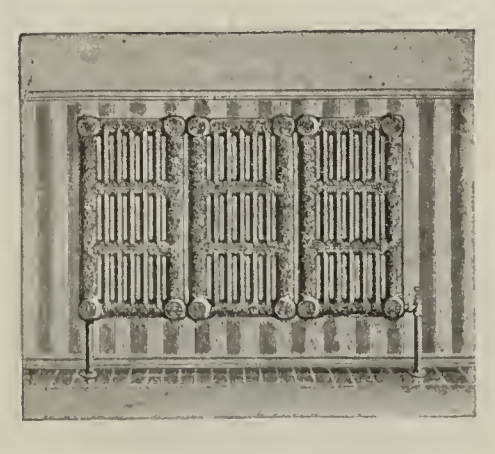


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" 6. Indirect Steam Heating.
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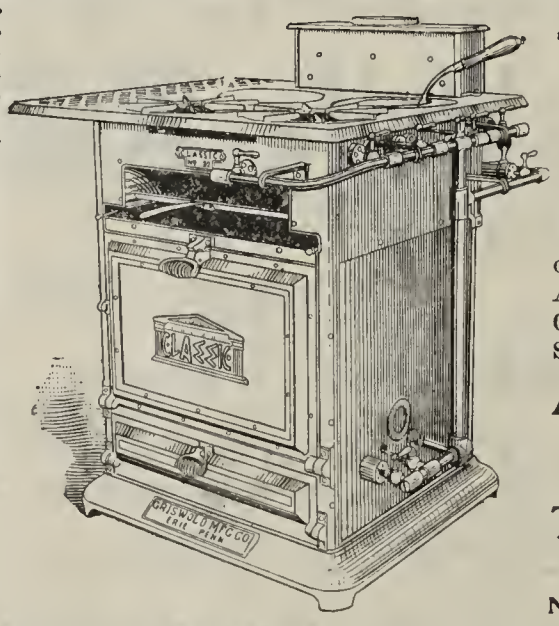
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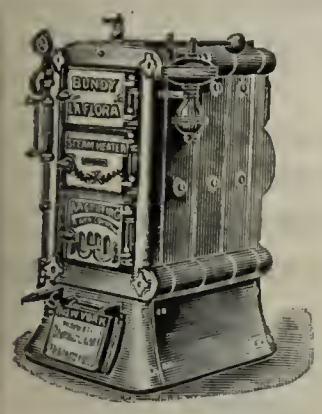
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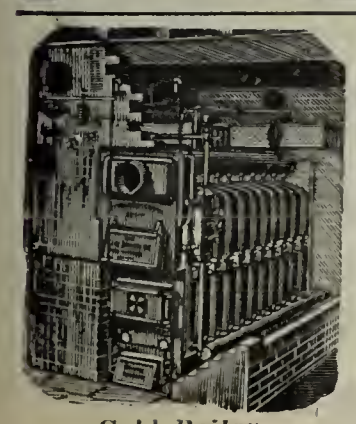
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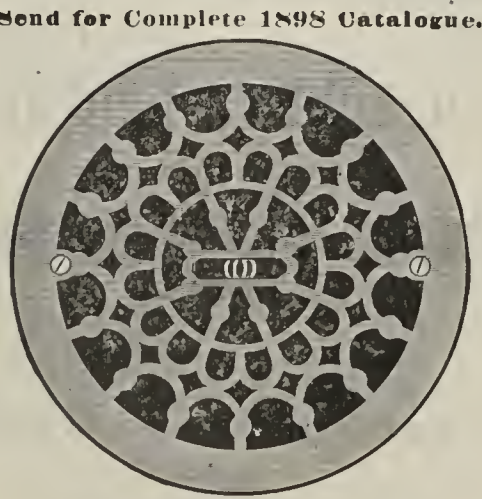
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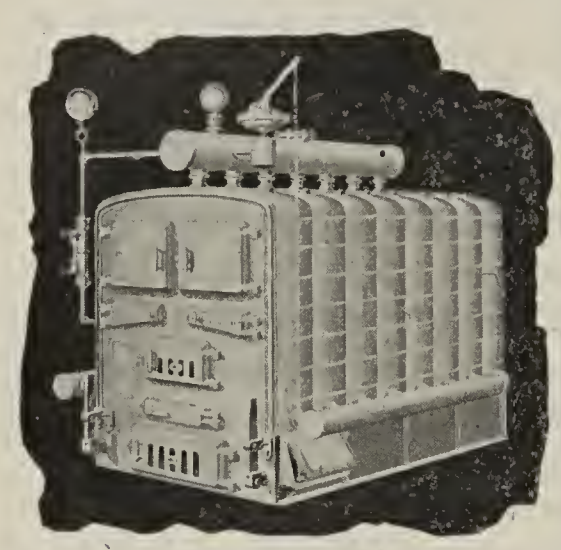
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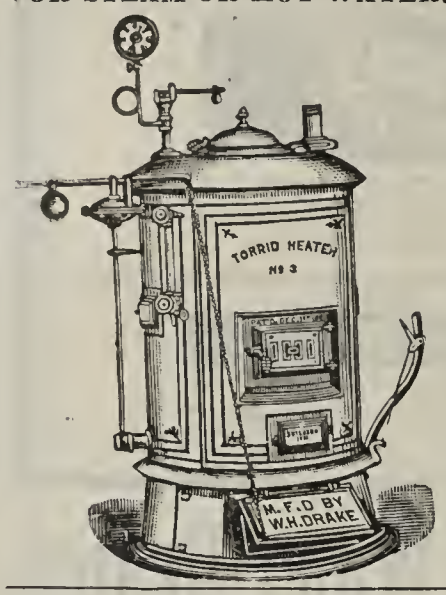
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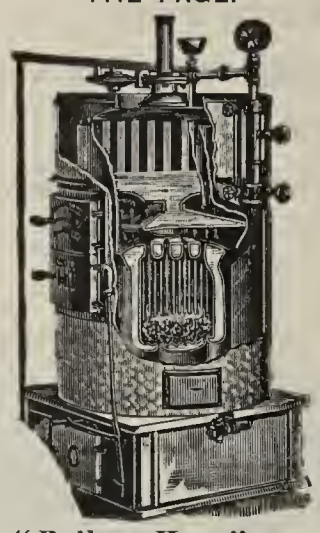
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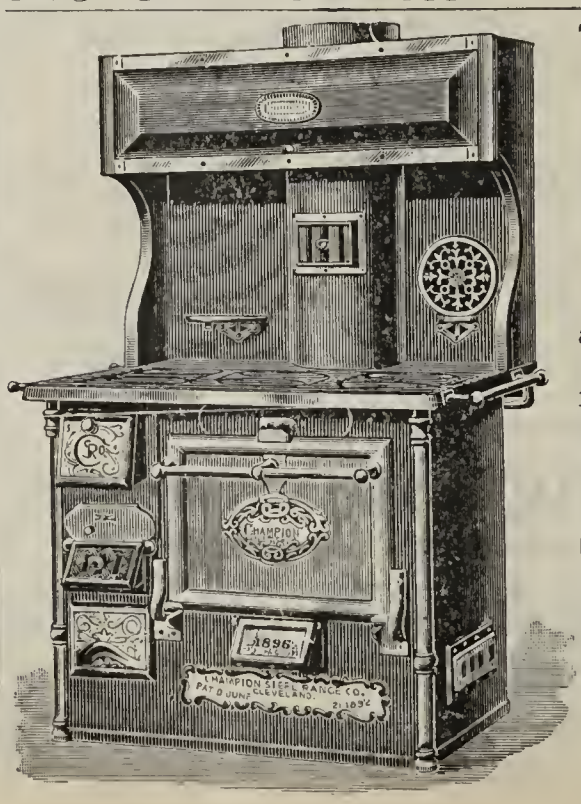
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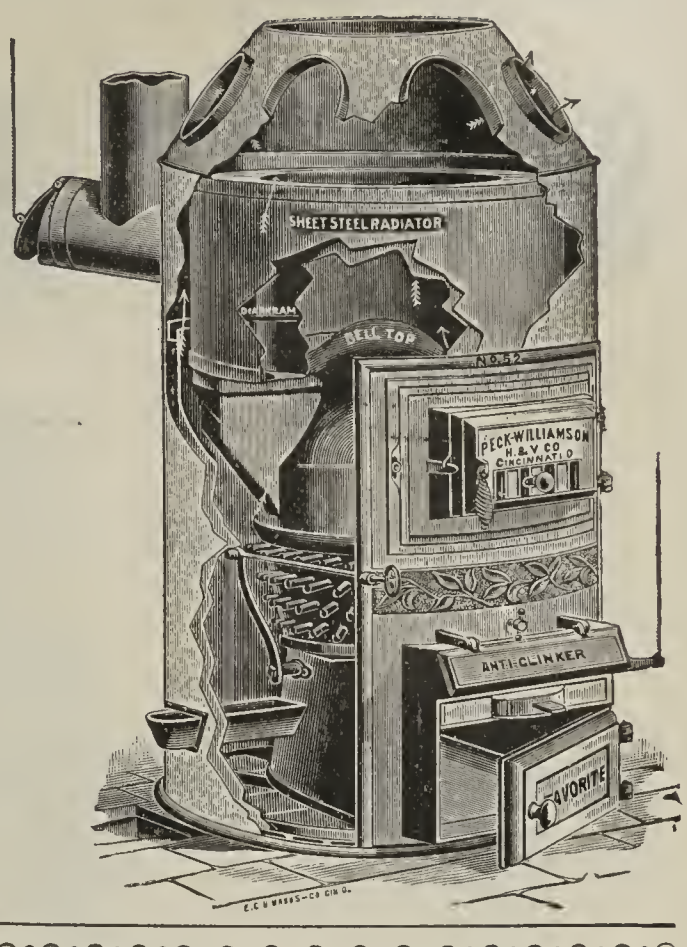
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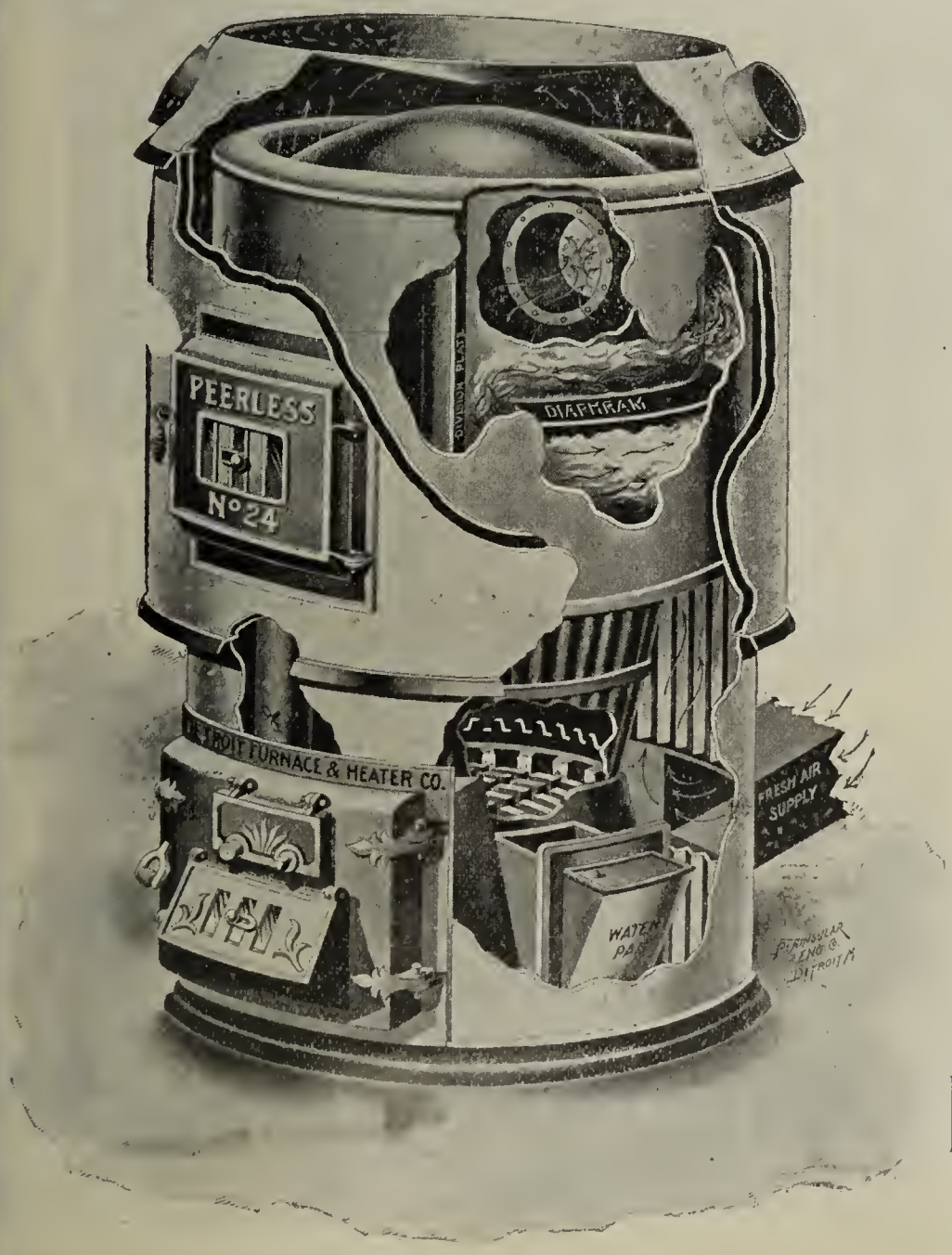
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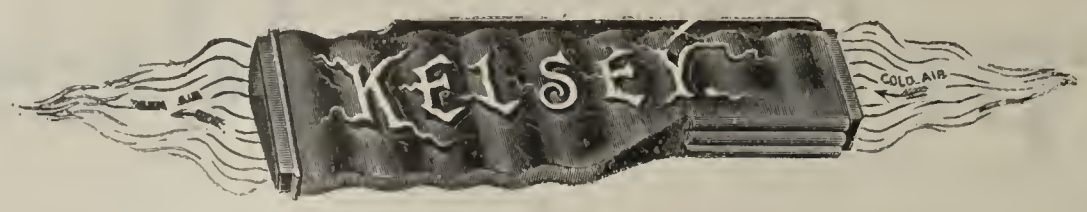
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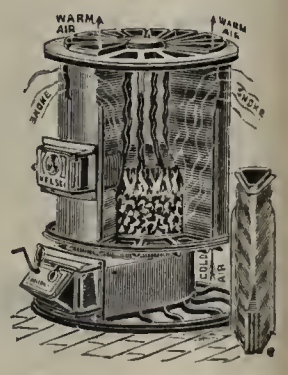
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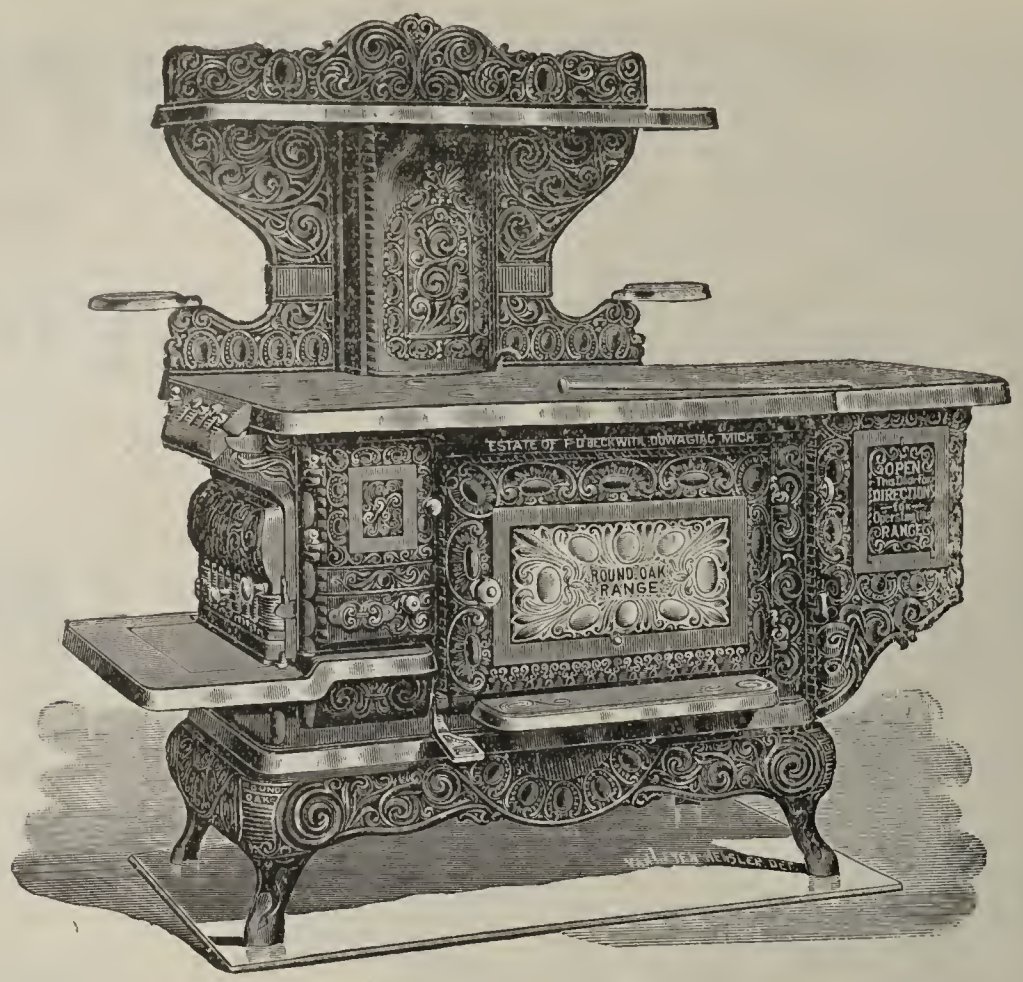
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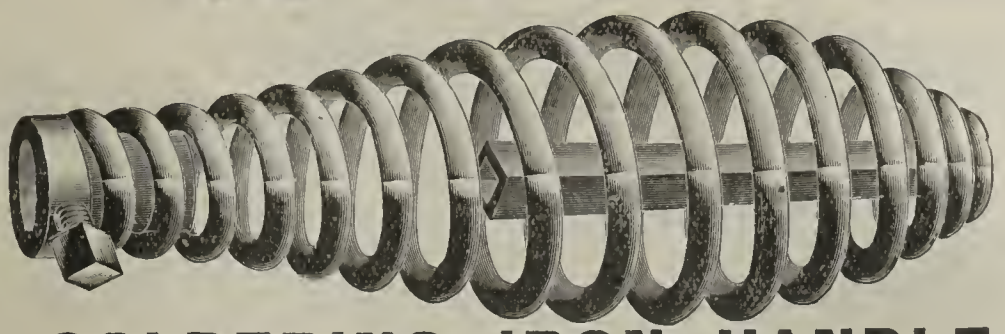
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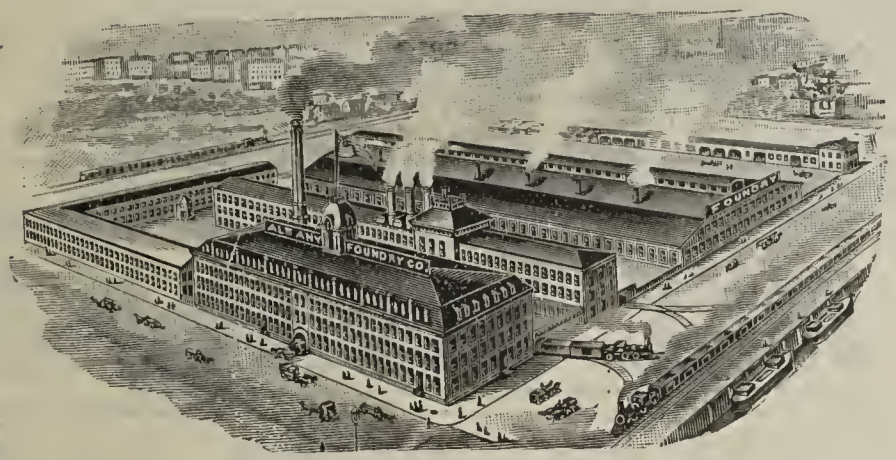
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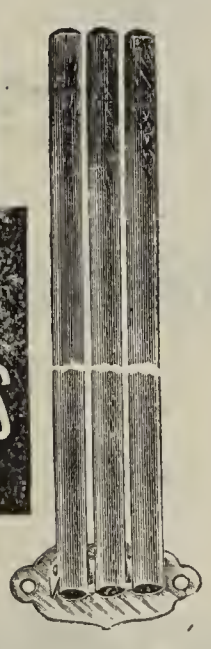


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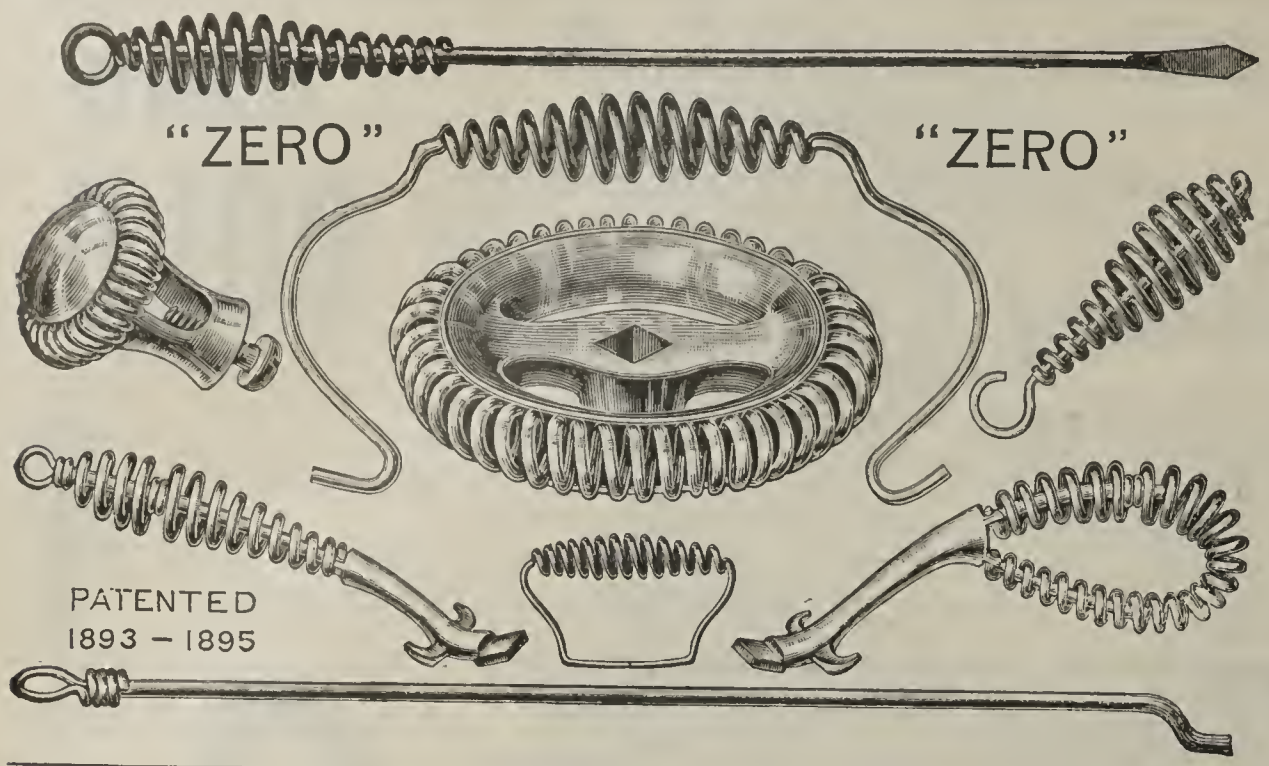
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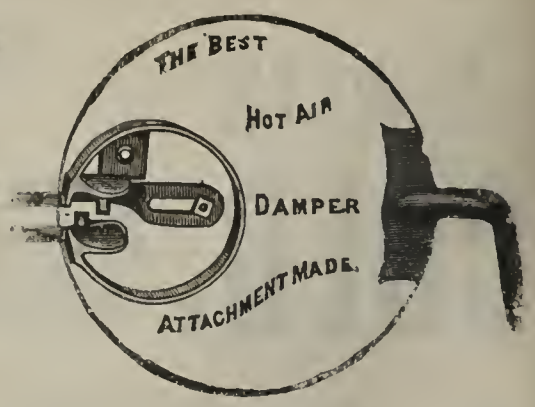
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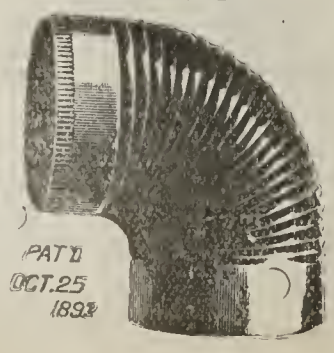
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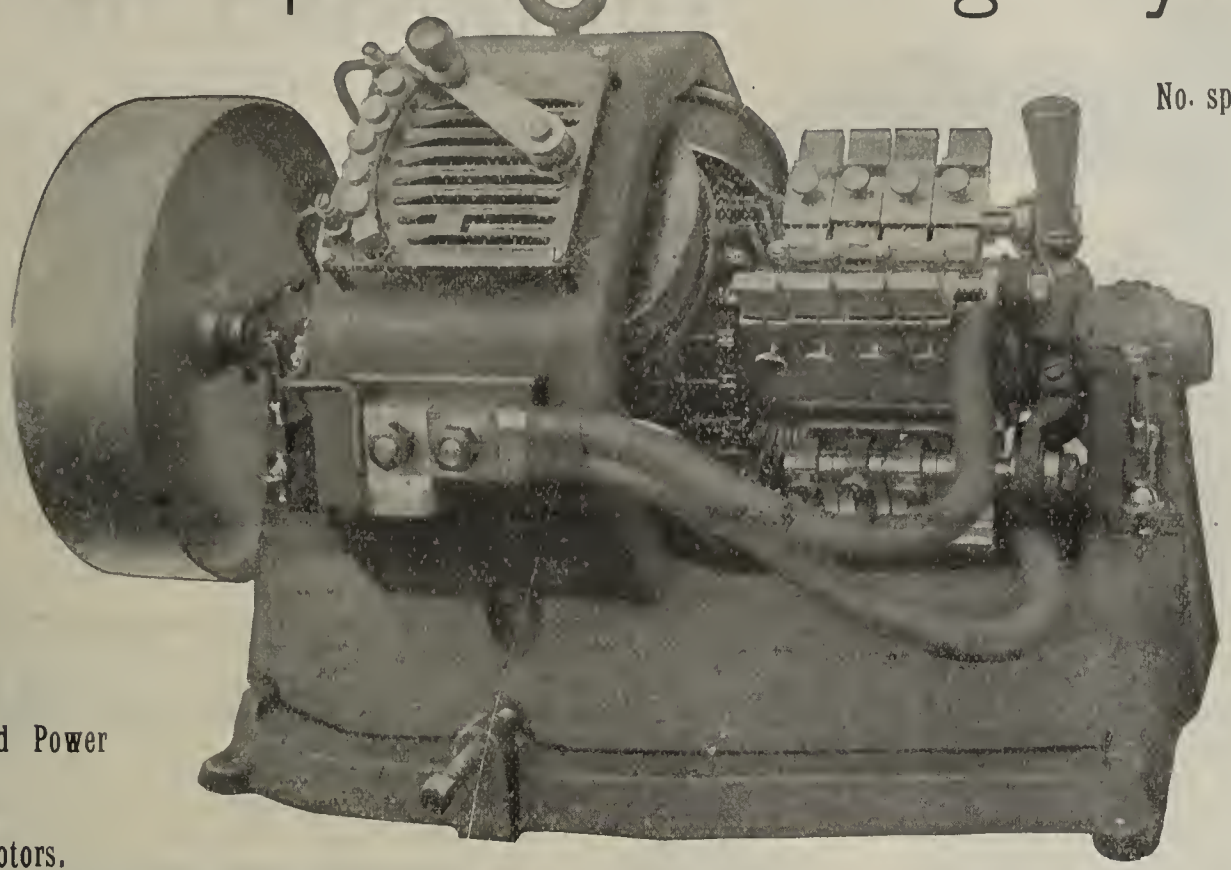


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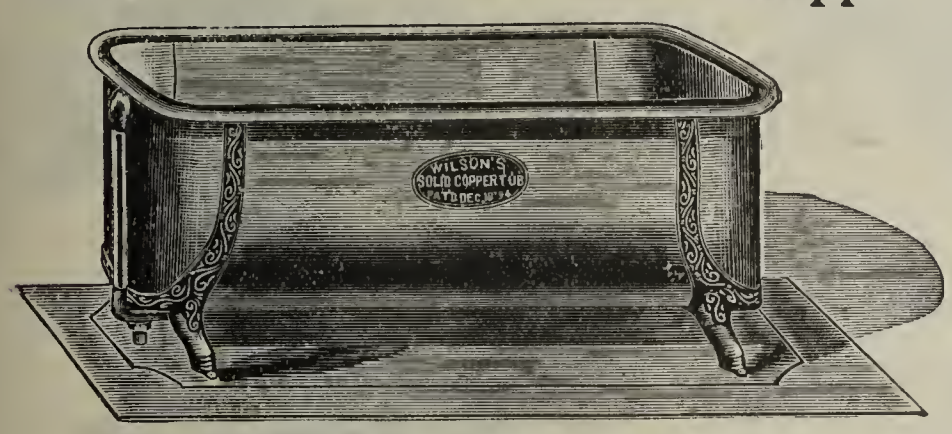
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As it is made with Ground Joint, requiring no screws or washers.

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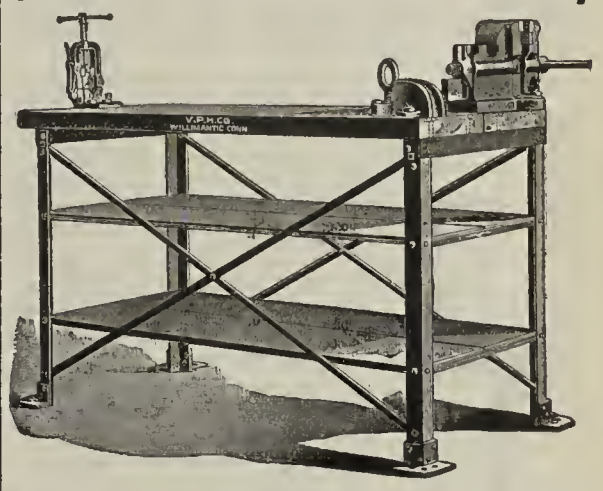
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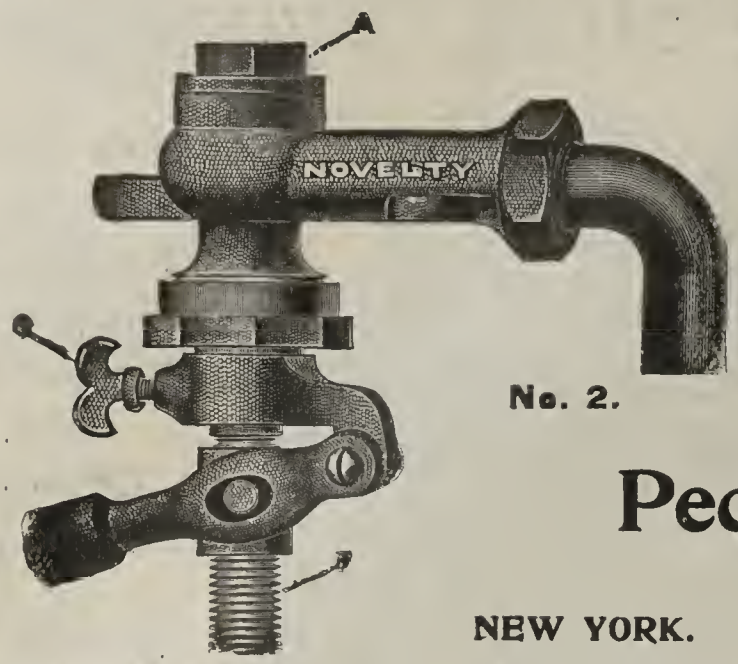


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Top Supply. Made also for Bottom Supply. Noiseless. For High or Low Pressure. Easily Repaired. Write for Prices.

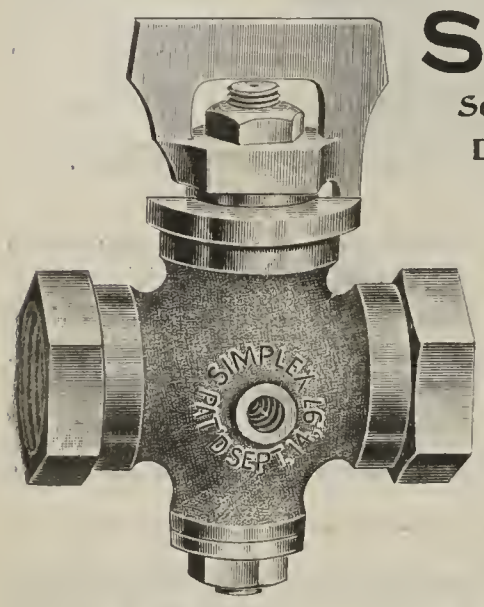
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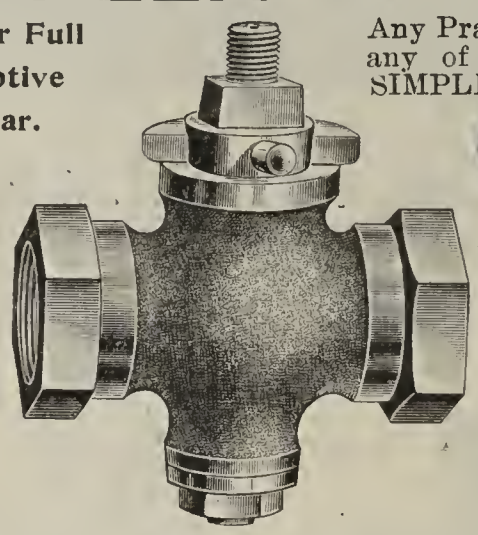
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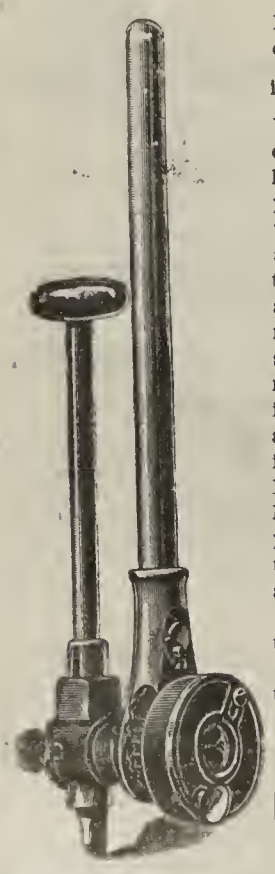
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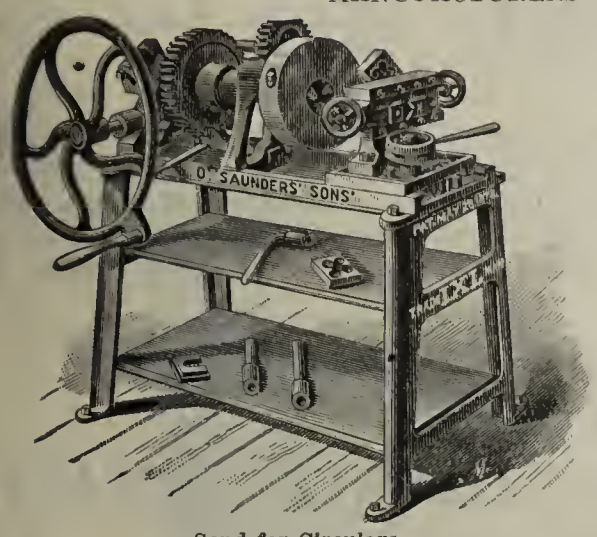
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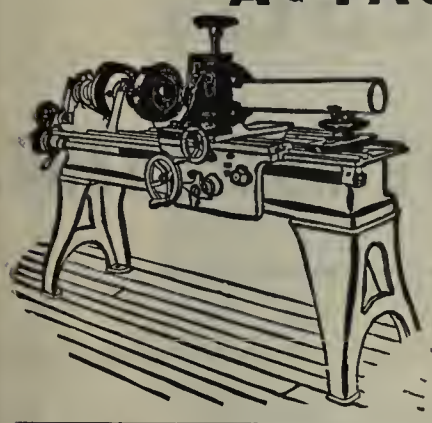
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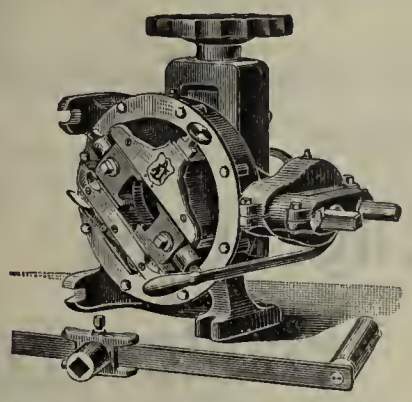
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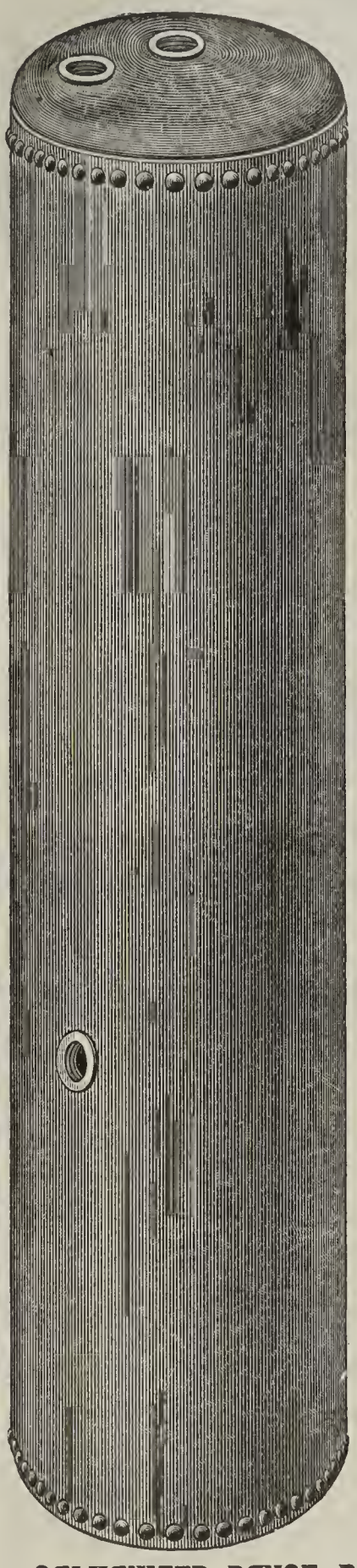
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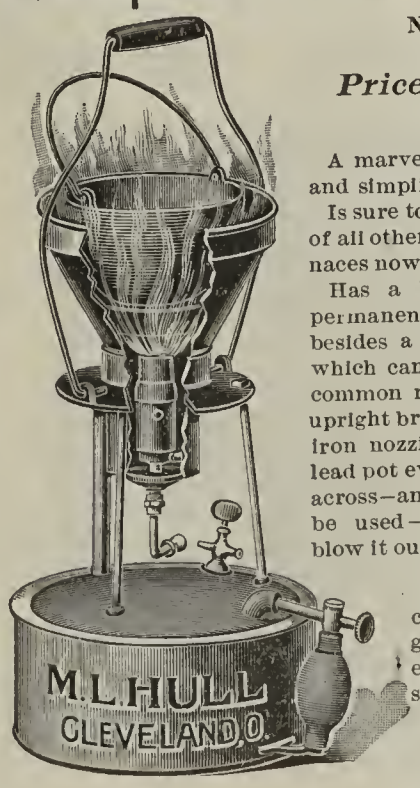
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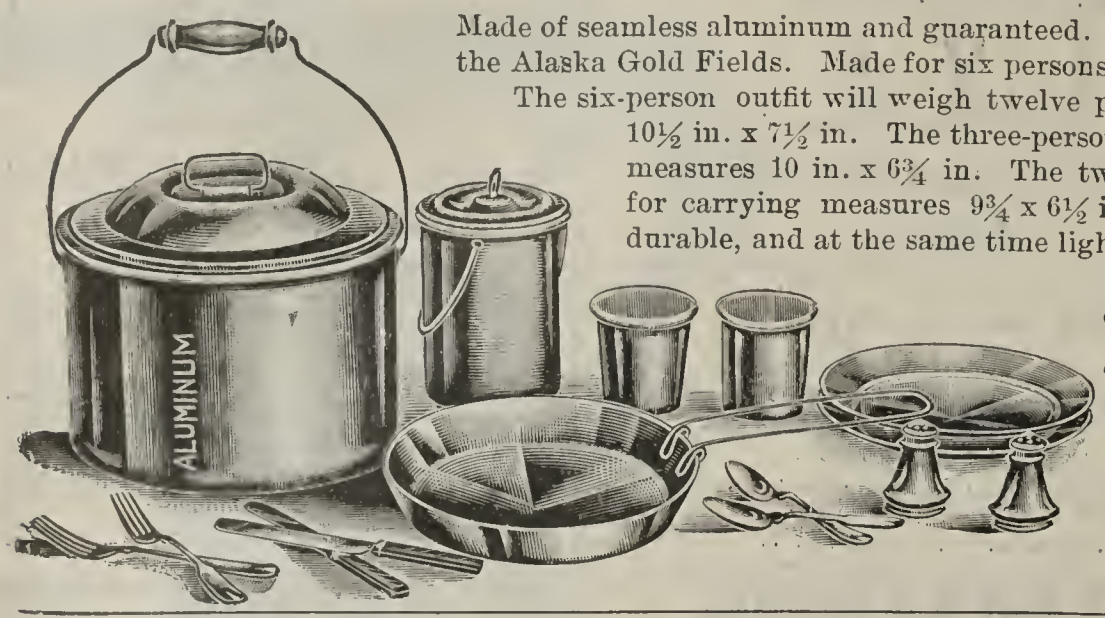
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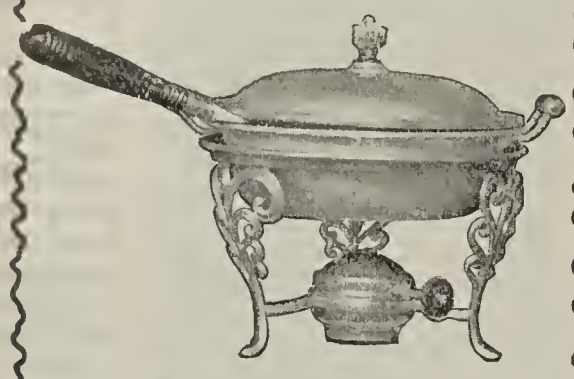
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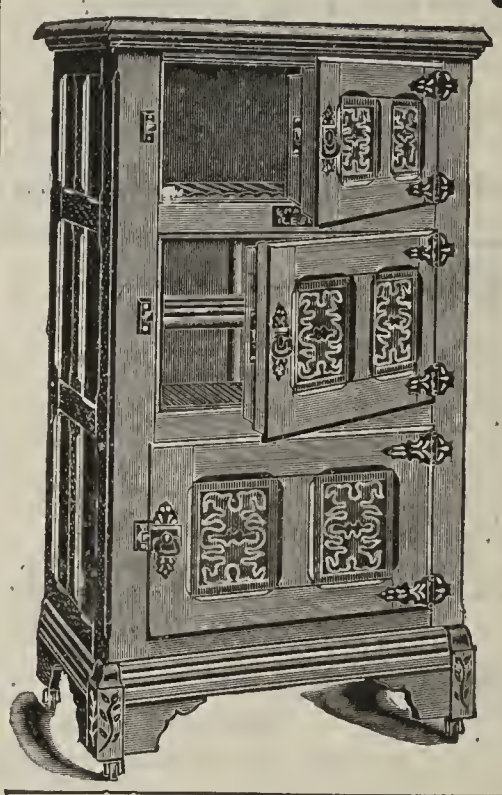
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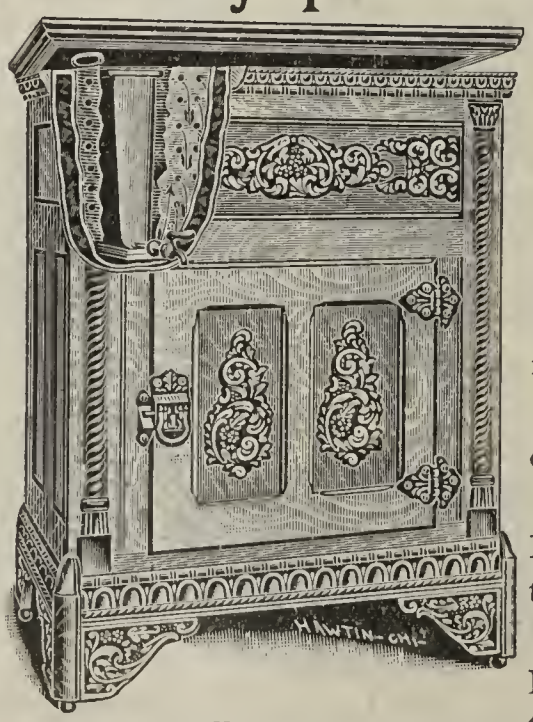
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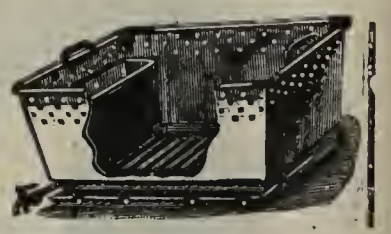
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No. 103

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"'No,' says the feller.

"'A near relative?'

"'No, only a very dear friend,' says the feller.

"'Too bad,' says the station agent, 'too bad. In the midst of life we are in death. But, my friend, you have one bit of consolation. The deceased is in no trance. He'll not be buried alive, you can be sure of that.'"—*New York Press.*

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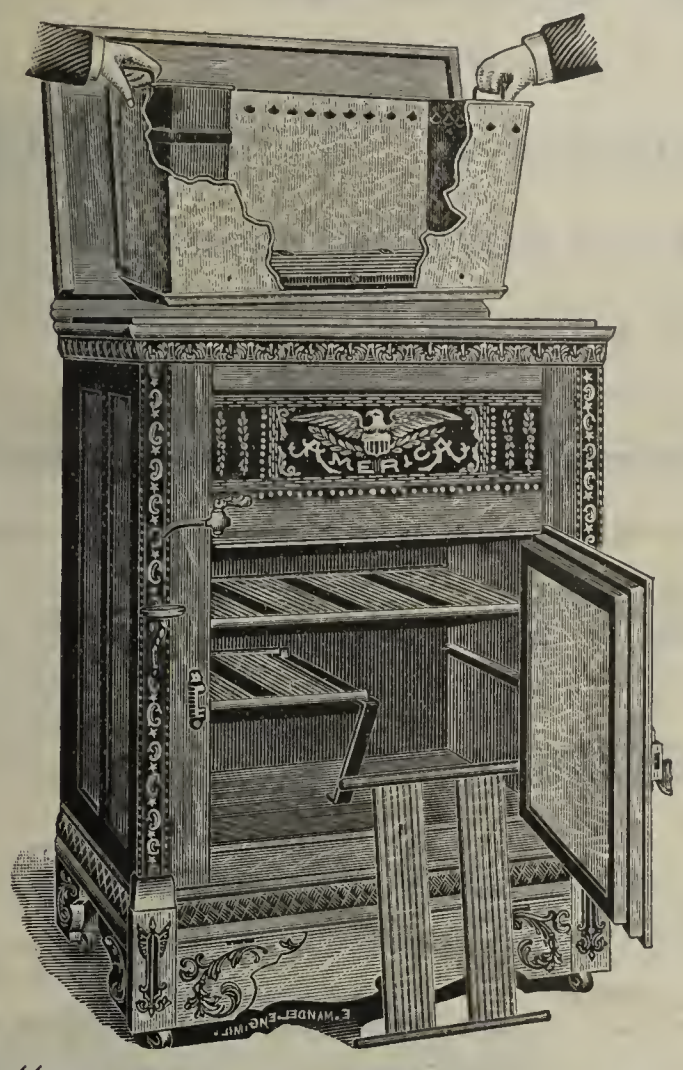
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Over 100 styles and sizes

IN ALL NEW GOODS.



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Send for Sample to compare

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SUMMARY OF CONTENTS.

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Elevators and Cranes.
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Counter Showcases.
Upright Showcases.
Ceiling Arrangement.
Sampling Goods.
Signs in the Store.
Pillars for Displaying Goods.
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Iron and Steel.

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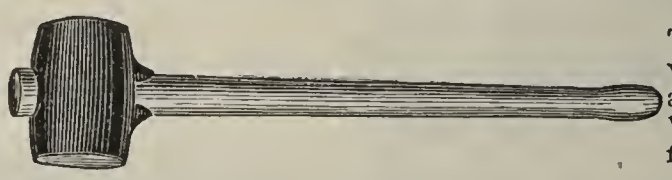
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Iowa Pattern.

THIS CAN

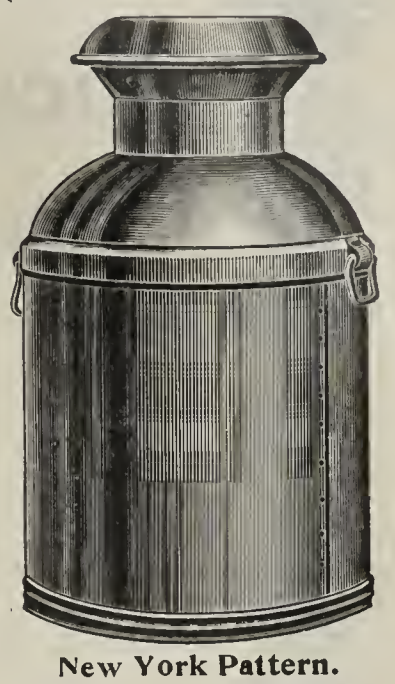
is made of heavy wrought steel. The neck and bowl, which is drawn in one piece, is double seamed to the breast, and the breast is double seamed to the body in such a manner as to form a very strong and rigid edge, and is protected by a heavy beveled edge iron band. The body and bottom rest on the O. G. heavy iron bottom band. The can is put together in the black and then double tinned very heavily, making it the strongest, most perfect and durable can on the market.

Gallons.....	5	8	10
Each.....	.....	.....	.....

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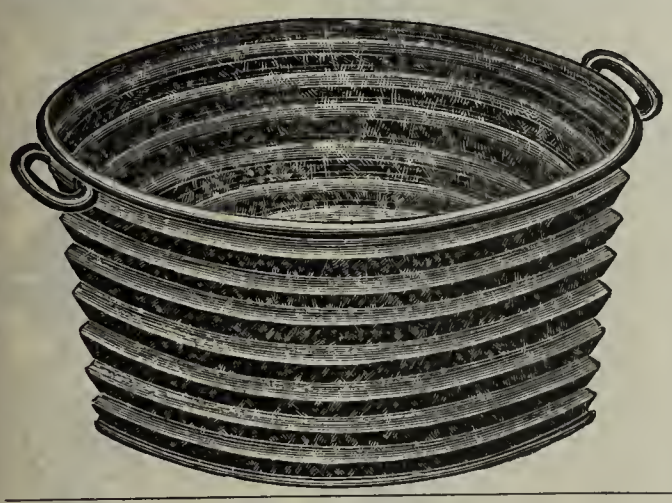
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MILWAUKEE, WIS.



New York Pattern.
With Noiseless Drop Handles.

ASK YOUR JOBBER FOR MILWAUKEE R. R. MILK CANS.



FOUR SIZES.

Number	0	1	2	3
Diameter at top, inches,	20⅝	21¼	23⅛	24⅞
Diameter at bottom, inches,	16⅛	18	19⅝	21
Capacity, quarts,	44	52	62	71

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Galvanized AND Corrugated WASH TUBS.

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Strongest, Best AND Most Handsome Wash Tub Made.

NO BUCKLING OR BENDING.

CORRUGATED ON BOTH SIDES AND BOTTOM.
SIDES MAY BE USED AS A WASH BOARD.

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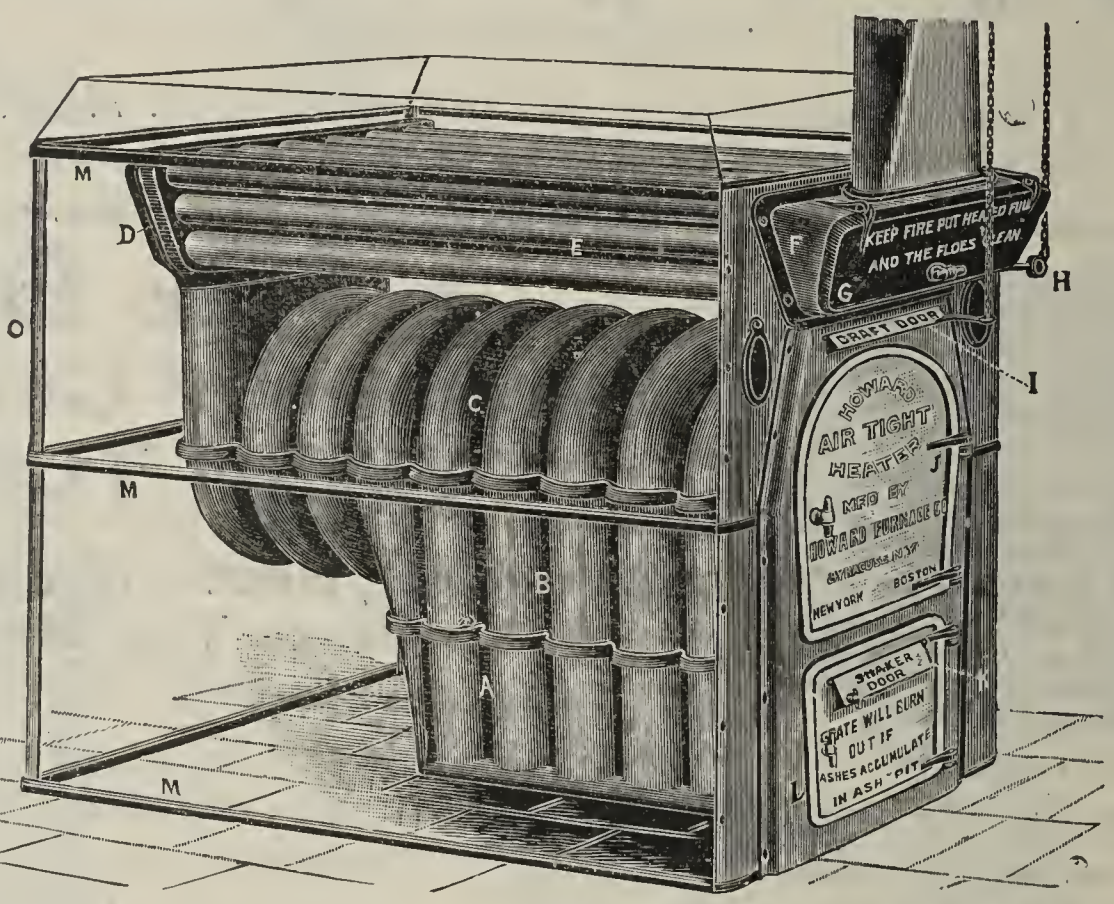
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Start the New Year

with our line of tubular construction. It will bring you business away from the best of them. Try it. A letter of enquiry is solicited. Already the reports come to us, telling how well these furnaces act. If you want letters of commendation, we can furnish them by the score. We believe we can satisfy anybody as to their worth. Why not you?

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NEW YORK OFFICE,
231 Water St.

BOSTON OFFICE,
198 Spruce St., Sta. H (Chelsea).

THE METAL WORKER

NEW YORK AND CHICAGO.

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Index to Reading Matter.....Page 58.

The Business Situation.

In reviewing the condition of business for the past week, and estimating the future, the tone of the review will depend upon whether it is based upon the actual state of trade in the country or whether it is the expression of the condition in Wall street, which, being the money center, is the most sensitive index of the industrial situation. More properly speaking, however, it is the barometer that foretells disturbances, the timidity of capital being proverbial, and any cloud upon the business horizon will make its influence felt. So far as the actual volume of trade is concerned, the record of the week is very satisfactory. Reports from different sections of the country summing up the business for February very generally show an increased activity and amount, the total trade for the month being considerably in excess of 1897. The changes in prices in the lines in which *The Metal Worker* is interested have not been many or important. In wire an advance, determined upon some time ago, was put into effect after March 1. The tone of the metal markets has also been strong, particularly in the case of tin and copper, lead and spelter having been quiet and easy during the week, while tin plates continue to be unsatisfactory. The stock market has shown quick changes during the week, and the tendency has been downward, with a decidedly uncertain feeling on some days. The situation in Wall street reflects the uncertain relations existing between this country and Spain, for while it is pretty generally believed that the Spanish Government was in no wise implicated in the loss of the "Maine," there is no doubt that in Washington a certain tense feeling exists, and the Government is showing worldly wisdom in making preparations for whatever may happen. The daily press by unexampled misrepresentation and invention have, in a measure, wrought upon public feeling, though the people are being educated to disbelieve these imaginative journals, and can more calmly read their hysterical fairy tales.

The Foundry Iron Situation.

Manufacturers of foundry iron are not unanimous in their support of the opinion advanced by General Manager Swank of the American Iron and Steel Association that an advance in prices is needed. They agree with him that the situation is unsatisfactory and hope for an improvement. But the improvement which is most desired is an increase in consumption. The production for the past month or two has evidently outrun the consumption in foundry iron, as shown by the weakness in prices. Too many sellers are soliciting the favor of buyers. When we emerged from the slough of despond some months since, and the situation began to brighten, it was feared by conservative manufacturers that too many furnaces would be blown in. For a brief period their fears seemed groundless, but it must now be conceded that the trend of recent events has been in the direction of their predictions. An advance in prices would not correct prevailing conditions by any means. Impatient owners of other idle blast furnaces would seize the opportunity to re-enter the market if the price advanced above their cost line, and the situation would be made worse.

Producers of foundry iron are watching developments in the export trade with special interest in view of the pressure on the domestic markets of the present tremendous output. They hope that relief may come in that direction if not from the expansion of domestic consumption. The growing exports from the South excite strong hopes that in the very near future the surplus product in that section may find more attractive markets abroad than the well supplied consuming centers of the North. Southern producers are not always the chief disturbing element in the foundry iron trade, but they have gained that unsought distinction recently. They have upset calculations and rudely shaken dreams of a reasonably prolonged season of maintained prices if not of large profits. There are grounds for hope of an improvement in consumption with the approach of spring, which may give the hungry enough business to keep them satisfied. But volume of business, whether of foreign or domestic origin, is more needed than an advance in prices.—*The Iron Age.*

The Navy of the United States.

In time of peace prepare for war is undoubtedly the axiom that has been governing the recent preparations to place our sea coasts and our fleet in such an efficient condition that come what may we will be found on guard. It can be confidently asserted that, to a greater extent than is generally believed, we are already quite well off in the way of fortifications and ships. Obviously we are not yet in such a condition as will enable us to cope successfully with Great Britain. It is equally true, on the other hand, that we are ready to meet on more than even terms such a nation as Spain. Even supposing the fleet of Spain to be the equal in numbers and efficiency to our own—which is by no means the case—still would it be at the great disadvantage of having to steam 3000 miles to reach our coast, where having arrived it would be in the embarrassing situation of having no coal depot, no fitting out port and no equipping yard.

Our navy to-day is composed of the following ships, all of which can be made ready within a week, most of them within 24 hours:

First-rate vessels, 5000 tons displacement and over, 11, of which 8 are armored.

Second-rate vessels, 3000 to 5000 tons displacement and over, 13, of which 5 are armored.

Third-rate vessels, 1000 to 3000 tons displacement and over, 27.

Fourth rate vessels, 7.

Of this total of 58 ships, 40 are now in commission doing active service in the different waters of the globe as follows: In the Atlantic, 23 vessels ; in Europe, 2 ; in the Pacific, 7 ; in Asia, 7, and 1 on the great lakes.

The work cut out for this fleet is now before it : In Europe the small squadron of two vessels would be sufficient to create uneasiness in Spain and necessitate the retention in home waters of a fleet of equal power. In the Pacific the Palawan, Caroline and other Spanish possessions could be captured by the Pacific squadron. In Asia the Philippines would be blockaded by our fleet now there, and in the Atlantic, Cuba and Porto Rico would be invested. It is here off Cuba and Porto Rico where the decisive action would be fought; and superiority in numbers alone should insure us the victory.

There is no attempt made in stating these palpable facts to belittle the Spanish navy ; so far as it goes it is an excellent one ; indeed, some of its vessels of the most modern types are models of advanced naval architecture, but it is not so large a navy in any respect as the American. This can be better realized perhaps by giving some figures pertaining to the approximate available marine forces of the two countries.

The armored displacement tonnage of Spain amounts to 68,000 tons; that of the United States to 86,000 tons, excluding the 13 old style monitors, one and a third greater.

If all the guns mounted on board the Spanish armored ships were to be fired at once the weight of the amount of metal thrown would be equal to about 10 tons ; the amount of metal thrown by the United States fleet would be about 16 tons—more than one and a half times heavier.

In our navy we have an excellent type of battle ship in the "Indiana" class, of about 10,000 tons displacement. Notably heavy are the batteries mounted on the three ships of this class; each ship carries the tremendous armament of four 13-inch, eight 8-inch and four 6-inch guns. In the way of protection the thickest side armor is to be found in the partial belt protecting the vitals ; this armor is 18 inches thick, of nickel steel. The four largest guns, more than a foot in diameter of bore, are mounted inside turrets of 17-inch steel, and the other guns are protected by 5 inches of the same metal. The speed of the ship is 15.5 knots, and though the coal supply of 400 tons is not large, yet is it sufficient to enable the ship to perform well any service within 500 miles of our coast. The "Iowa" is another battle ship, a little larger than the above, and not unlike them in other respects. Still another battle ship is the "Texas." She is considerably smaller, only 7000 tons, with two 12-inch guns and six 6-inch, but she is a very efficient ship indeed. These five battle ships constitute a bulwark of safety incomparably superior to any force Spain can bring to demolish it.

Of the type of vessel known as the armored cruiser our navy has two—the "Brooklyn" and the "New York," of 9300 and 8300 tons, respectively. The former is the better ship in every way, mounting eight 8-inch and 12 5 inch guns to the latter's six 8-inch and 12 4-inch. The armor of the "Brooklyn" is 3 inches thick on the belt and 8 inches on the turrets, that of the "New York" 4 inches and 10 inches for corresponding positions ; but the former's armor is of the latest development of face hardened Harveyed nickel steel, and is stronger than the "New York's." Both ships are capable of fighting long and hard and well.

Other armored ships in our service are the armored ram "Katahdin" of 2200 tons, unarmed, except for small rapid fire guns, and designed exclusively for attacking with her ram. And we have besides five double turreted monitors, the most powerful being the "Puritan," of 6000 tons displacement, armored on sides and turrets with 14 inches of metal and mounting four 12-inch guns and six 4-inch rapid fire guns. The other four monitors are of 4000 tons each, with 11 inches of armor and four 10-inch guns. These monitors are essentially coast defenders ; in smooth water they have been proved to be an admirable type. Spain has no analogous type to them.

Our unarmored fleet is not so large as might at this juncture be desired. Our naval authorities have virtually stopped constructing the unarmored type of cruiser, considering that our more pressing needs lie in the direction of obtaining more battle ships and torpedo boats. We have 16 unarmored cruisers, varying greatly in nearly every particular—in size from 2000 tons displacement in the "Marblehead" to about 8000 tons in the "Minneapolis ;" in speed from 15 to 23 knots, in armaments from 4-inch guns to 8-inch guns, &c.

However, in addition to these cruisers we have what are technically called gunboats ; in reality they are cruisers of a less displacement than 2000 tons. There are nearly 25 of these gunboats. They are armed with 4, 5 and 6 inch guns, have good coal carrying capacity, good speed and are capable of doing good service, on the blockade, as scouts, as dispatch boats, as aids to the larger ships and to fight other unarmored vessels.

A type of small vessel that can be of much value to a fleet, especially when the theatre of operations is near a home base, is the torpedo boat. These small craft can dart about hither and thither carrying orders, firing their torpedoes, slipping past blockades, and in many ways assisting a fleet of heavier ships. Our navy is still weak in this important element of defense, and though great efforts are making now to better it, it is doubtful if we could get ready for immediate hostilities more than 15 of these craft. These torpedo boats are some of them of 100 tons displacement, others of 150 to 18, with speeds varying from 20 to 30 knots.

In closing this brief description of our fleet as it exists to-day ready to be mobilized—that is, passed from a condition of peace to a condition of war—mention must be made of auxiliary cruisers or casual cruisers, as the Ordnance Department calls them. These are merchant steamers that have been inspected by navy officers with a view to mounting guns on board them in time of war so as to utilize them as cruisers. About 35 steamships have been listed for this cruiser service, plans for mounting guns on board them have been drawn up and the duty to which they are to be assigned is understood. Undoubtedly they would all be pressed into service should a war arise.

Of personnel the American navy has 566 line officers and 181 engineer officers, besides doctors, paymasters and others sufficient to meet the present demand. Of men there are 11,000 sailors and 750 boys.

We present these authentic data, not because we believe that a conflict is impending, but because they put at rest some of the very wild statements which have been flaunted in the public press. It is certainly not a proud position for a great country to be forced to figure its capacity for resistance against a third-rate power. The incident should bring home to our people the necessity for a speedy development of our navy and of our coast defenses.—*The Iron Age.*

Lead Coated Mirrors.

Lead is not generally regarded as a material that would adapt itself to purposes of reflection. But Monsieur Berthelot, the eminent French chemist, has discovered that the metal was used as a reflecting medium by the ancients. His recent researches have been devoted to some glass mirrors lately unearthed near Rheims, France, which date from the third and fourth centuries. In these mirrors he found the glass was coated with a metallic substance and also with a layer of whitish material. The metal proved to be lead, with no trace of gold, silver, copper, tin, antimony or mercury, nor was there any organic substance present, showing that no extraneous material was used to cement the lead to the glass. The mirrors appeared to have been cut from hollow blown glass globes, and it is posible that, before being cut, the molten lead had been poured into the interior, adhering to the previously warmed glass. The whitish layer consisted of lead carbonate and lead oxide formed by the oxidation of the lead coating and calcium carbonate which had been deposited from the water of the district in which the mirrors were found.

The United States Acetylene Liquidation Company, whose plant in Jersey City, N. J., was destroyed by fire last December, have decided to establish at Lebanon, Pa. The plant is the only one of its kind in the United States, and supplies all the liquefied acetylene for the Government buoys and harbor lighting, as well as the general trade.

THE LETTER BOX.

Apparatus for Cooling Water.

From J. B. C., Brooklyn, N. Y.— I have had a call from a manufacturer to devise some means of supplying a quantity of iced water at about 45 degrees Fahrenheit, with as little possible loss from friction due to coils, &c. The quantity of water is about 15 gallons per operation through a ½-inch nozzle, the maximum operations being about six per hour and about 30 per day of nine hours. The water when used is about 55 degrees Fahrenheit, using the main water supply to increase the temperature, the supply from the main in the summer being about 65 degrees. My idea is to have two cylinders made about 4 feet long to contain about 25 gallons of water each, with large inlets and outlets to reduce the friction. I would place these cylinders horizontally in a tank of water (well insulated), 6 feet long and 3 feet wide, placing the ice on top of the cylinder so as to be immersed in about 3 inches of water and so immediately chill the water that enters the cylinders. In my experiments I found that placing ice on a small cylinder and allowing the drippings to run off as in a refrigerator is not at all effective. I believe that to chill the water as I intend to will take about 400 pounds of ice, and this I think is too much to obtain the object desired. As this water is to be used every day would it be practicable to use a small ice machine or apparatus, not to make the ice, but to chill the water in the tank? If this is practicable I would be glad to have some particulars, as I am quite ignorant on the subject. Are there any publications that relate to work of this kind from which I could get some data to proceed on? Would better results be obtained by putting, say, about 400 pounds of ice into a 250-gallon boiler or tank, such as is used to heat water for large buildings and flats, making use of the two manholes on top for putting in the ice? The objection to this plan would be the trouble of shutting off the water each time the ice was needed. If, however, better results can be obtained by this plan the objection to shutting off the water would not be a serious one. I would consider it a great favor if the readers of *The Metal Worker* would give me some suggestions and opinions on the subject through the Letter Box.

Answer.—Supposing that our correspondent requires the water to be used at a constant temperature of 45 degrees, we do not find that the two cylinders that are suggested, nor any small coil arrangement, will meet the requirement of the intermittent use of the water as stated. By any such arrangement the tanks or a small coil filled with water, after standing during the intervals between the times of using the water, would with the water they contained become too cold and the water entering during the drawing of the water would not sufficiently change in temperature, so that there would be no equality of temperature in the water drawn. With the view of a day's supply of even temperature water we suggest a large round wooden tank, say 6 feet diameter, 4 feet high, thoroughly insulated bottom and sides. Place in the tank a bent coil of 2 inch pipe, say 100 feet in length, which will hold 20 gallons of water and expose 60 square feet of cooling surface. Place an overflow to the tank and fill it with water, say 500 gallons, at an average temperature of 60 degrees F., say 3750 pounds. To cool the water and coil filled with water to 45 degrees will require 450 pounds of ice for the first charge, which should be made at night. This will cool the whole body of water, coil and contained water, to a little below 45 degrees, when the day's operation can commence. For each time that 25 gallons of water are drawn from 13 to 18 pounds of ice should be added to the tank, according to the variation in the supply temperature, which will keep the water in the tank at a nearly constant temperature of about 42 degrees, the large body of water in the tank so equalizing the temperature of the water drawn that it will not vary more than 2 or 3 degrees. The daily use of ice will then be about 450 pounds, which will be much cheaper than to run a small refrigerating machine. For a study of the principles and different methods of refrigeration we can furnish Siebel's "Compend of Mechanical Refrigeration" for $2 50.

Laundry Drier.

From C. B. H., Tariffville, Conn.—Can you or any of your readers give me data in regard to a laundry drier? I want instructions upon how to build and heat a small room, say 4 feet wide, 6 feet high and 6 feet long. As all know, outdoor drying of clothing when passed through a wringer when washing is at the best uncertain, whereas if each batch could be dried in 20 or 30 minutes after washing family laundry operations could be carried on continuously, one lot drying while the next could be washed. There are several such appliances in the market, but they cost $140 or so, which is too high for the ordinary purse. It would seem to be within the mechanical ability of any carpenter or tinsmith to build such an inclosure as I speak of, with an oil or coal heater at the base and ducts for the admission and exit of warm air, so as to thoroughly dry one batch of clothes in the time spoken of. The frames, with galvanized iron lines, could be drawn out and loaded and then pushed in again, a wire netting being stretched across the base over the stove, which should be at the base or just outside the base, for safety. I have found so much useful information in your columns that I thought I might get some serviceable suggestions from some of your readers.

Trouble from Rusty Water.

From W. L. D., Keene, N. H.—The plumber who states in *The Metal Worker* of February 19 that he has had trouble from rusty water from a copper range boiler may find his trouble due to the same cause as that of a similar experience of our own, through which we have just passed. We put in a new stove and a copper pressure range boiler and used all brass pipe. The hot water was about the color of strong tea. We supposed, of course, that it must be discolored from the use of a cast iron water front. We replaced the water front with a brass water heating coil, which made no difference in the water, which was just as rusty as before. We then changed the copper range boiler, using one of another make, which cured the trouble. We found upon examination that the boiler which gave the trouble had a steel coil inside to prevent collapsing. It is quite possible that the plumber who is seeking assistance has one of the same make of boiler.

Can Steam Be Generated by a Range Boiler?

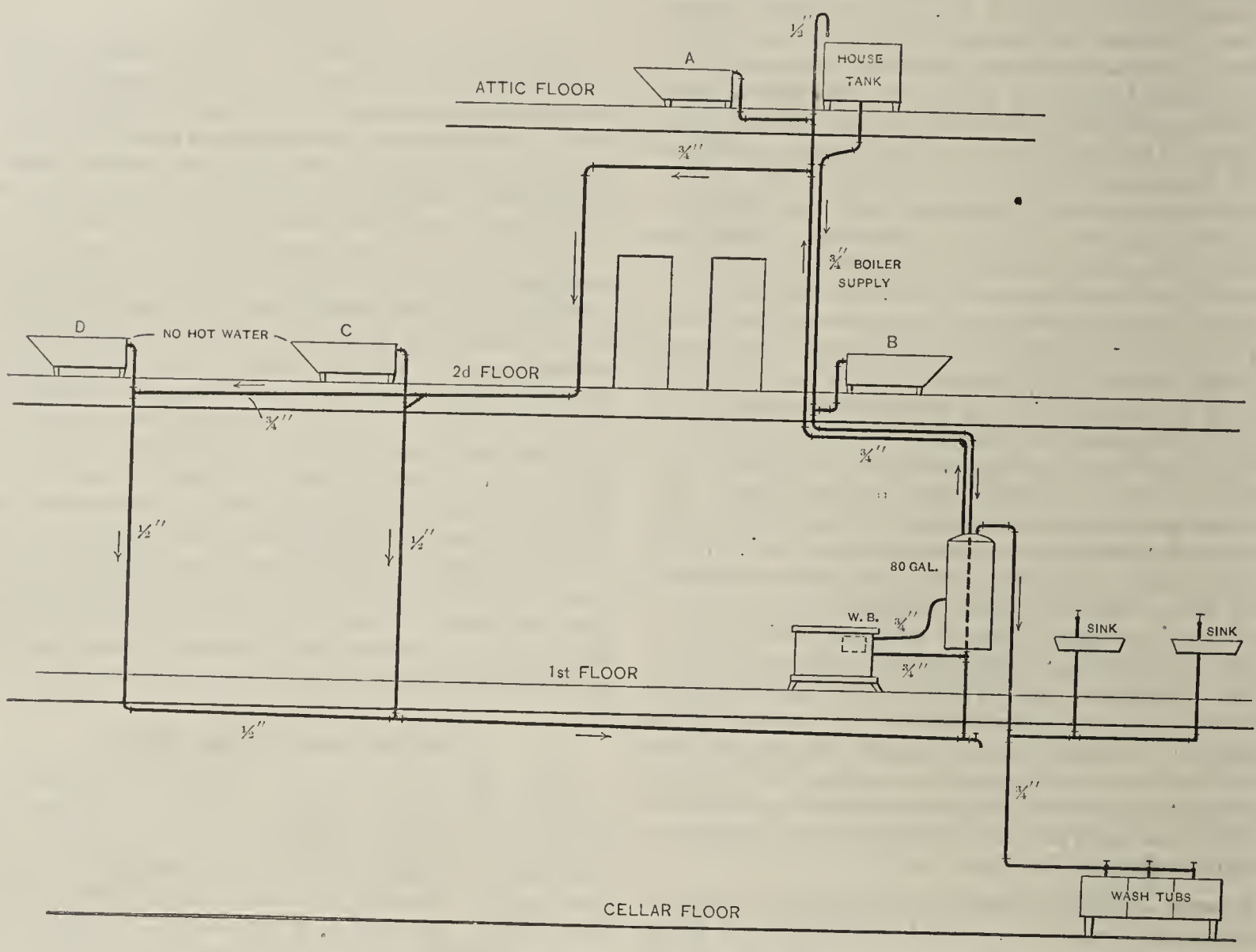
From W. H. F., Stroudsburg, Pa.—Is it possible to generate steam in a circulating range boiler under 40 pounds pressure with an ordinary range water back?

Answer.—The fact that the system is under 40 pounds pressure would render it more difficult to generate steam. However, if no hot water had been drawn from the boiler for a considerable time and a hot fire had been running in the range for several hours, it is possible that the steam generated in the water back might heat the water in the boiler to such a temperature that steam might accumulate in the top of the boiler. It is not an

uncommon thing for steam to accumulate in the boiler where the boiler is fed from a tank instead of a street pressure and in consequence the pressure on the boiler is very light. From the fact that steam may be generated in the boiler under such conditions it can readily be seen that it is only a question of hard firing without drawing off water to allow steam to accumulate in the boiler sufficient to force some of the water out of it. The steam will occupy an increasing amount of space until a limit is reached, when condensation will take place and water will run into the boiler to take the place formerly occupied by the steam and considerable noise, hammering and rumbling will result.

Cold Water from Circulating Pipe.

From S. C. L., New Bedford, Mass.—I should like to have information about a hot water circulation job which is shown in the sketch presented herewith. Is it proper to take the expansion pipe off from the highest point on the circulating pipe? Why don't the bathrooms C and D get hot water when A and B get it? Will the fixtures in the bathrooms C and D draw cold water through what is intended for the return ½-inch pipe to the bottom of the boiler sooner than draw the water through the ¾-inch pipe, and if so, why? Will a swing check valve placed in the lower circulating or return pipe in the cellar rectify the trouble? Does it make any difference about the size of the range and range boiler, and if so would a smaller boiler give better results? Is an overhead system with a return in the cellar good practice as a rule in a long building?



Cold Water from Circulating Pipe.

Answer.—In reference to the first question, would say that if the expansion pipe was not taken off at the highest point, as shown, the circulating pipe would become air bound, and possibly to such an extent as to entirely stop circulation. In answer to the second and third questions, it is not uncommon for the water in a system to take a reverse direction from that intended when the conditions are such as to permit it, and the failure to secure hot water at C and D may be readily accounted for in that way. In this case the more direct route to these fixtures is from the bottom of the boiler up the circulating pipe. By going up the circulating pipe there are only two turns to interfere with circulation before the fixture is reached, while in the regular hot service piping there are five turns which must be made, which must retard the flow, so that when the fixtures at C and D are opened the water naturally follows the line of least resistance from the point where the greatest pressure impels it. It is quite common practice to use a check valve on a circulating pipe to prevent just such troubles as presented in this case, and in many instances it would be difficult to overcome them without it. If the water back has the power to heat all the water in the boiler down to the bottom as the fire in the range is ordinarily run the size of the boiler and range will have no effect on the service rendered, but with so many bathrooms to supply it is probable that the water in the bottom of the boiler will be cold most of the time. Then if the water flows up the circulating pipe to C and D no hot water could be expected. There is no objection to the overhead system or to the return, but where it is possible it is preferable to make the return in a less exposed position than in the cellar. Owing to the water continually circulating it loses heat and requires a stronger fire than would otherwise be needed. The covering of the return under such conditions would be a material gain. It is quite possible that some better results would be accomplished if the return of the pipe from the tub C was omitted. With a check valve in the return a reverse circulation would be impossible, but with the pipe from C remaining it would be possible for a short circuit to be made and still leave the tub D improperly supplied under some conditions.

Cotton Seed Oil.

From H. V., Milroy, Pa.—Please give us through *The Metal Worker* information relative to cotton seed oil. What is its color, is it similar to linseed? Does its odor resemble linseed? Will it do as a substitute for linseed oil in painting if used alone? If it cannot be used alone

in painting, in what proportion could it be used? What would be the result if used alone for painting with white lead, iron oxide or venetian red for surfaced boards or siding, and also rough boards? Where can we buy cotton seed oil to good advantage? What is its specific gravity and weight per gallon?

Answer.—Cotton seed oil is of a brown color, pale orange or dull yellow color, depending upon the degree of purification or bleaching that has been applied in its production. The refined oil appears so much like olive oil in color and consistency as to require an expert eye to distinguish any difference. It weighs about 7½ pounds per gallon, and has a specific gravity of from 0.92 to 0.93 (water 1). It is largely used for adulterating olive oil, for making or adulterating lard oil, for making lard, margarine and butterine. The price has fallen quite fast of late years and is now about 21 cents per gallon for crude, and 24 cents for refined. It has no drying quality and has not yet been substituted for linseed oil to our knowledge. Cotton seed oil can be purchased through the oil trade or the American Cotton Oil Company, 46 Cedar street, New York City.

New York Board of Examining Plumbers.

From O. B., New York.—Kindly inform me through the columns of *The Metal Worker*, as far as possible, of the best method of getting a plumber's license in this city. I would like to know where the board meets, and if it is required to have a place of business before making application, and whether there is a practical examination and what the cost is.

Answer.—The Bureau of Plumbing is under the direction of the Building Department at Eighteenth street and Fourth avenue, New York City, where application for a license should be made. It is necessary for the application to have the signature of two master plumbers who know that the applicant has had experience in the trade of plumbing. On filing the application a notice will be given to the applicant when and where he must appear before the board to be examined. The examination is both practical and theoretical. Those who apply for a certificate are expected to give the address of the place where they expect to engage in business. The cost of the license can be learned at the time the application is made, as we do not know what fee will be required by the new Examining Board just appointed. Under the old board the fee was $5 at the time the application was made.

Water Back Too Large.

From C. N. L., Woodbury.—I would like to receive through *The Metal Worker* some information that will enable me to overcome a trouble which I am having with a range boiler and water back. I recently connected a large range with boiler, and it seems that the range or water back is too large and therefore heats the water too much, causing steam to be generated, which makes the boiler dance. The boiler holds 24 gallons, and is of the vertical circulating type resting on a boiler stand. A No. 9 range is used and the water pressure is 53 pounds. The owner does not want to take the boiler out and put in a larger one, so I am called upon to remedy the difficulty. Would the trouble be overcome by putting a steam boiler safety valve with weights on the boiler and running the waste pipe over to the kitchen sink? Is there any other way that can be suggested for carrying off the steam without permitting all the hot water to run out of the boiler? Where and how should a safety valve be placed? Is there any kind of an arrangement by which I would not have to carry a waste pipe away from the boiler?

Answer.—The cause of the trouble in this instance seems to be clearly understood, that the water back is too large for the work, and the simplest and easiest way to overcome the difficulty is to take out the water back and to use a smaller one. If a smaller water back cannot be secured it is a simple matter to make a water heating coil of iron pipe with a close return bend. This will be far more satisfactory to all concerned than any attempt to use a safety valve or some other system. If the fire chamber of the range is of such a character as to permit the use of a fire brick between the fire and the water back now in use, so as to prevent the water back from excessively heating the water, this would be less trouble than to replace the water back with one of less heating capacity.

Wants a Local Vent.

From E. C. V., Stockbridge, Mass.—I would like to be informed whether in a job of plumbing it is necessary, according to sanitary requirements, to supply local or seat vents to the closets? I put up a job of plumbing for a customer, and did not put in the seat vent because no live chimney was near. Now my customer says the job is not complete. The contract did not call for a local vent, and I say that the job is complete. Which is right? There is nothing else in the job with which fault can be found.

Answer.—The local vent is not essential to make the job sanitary, and is a provision that is confined to localities rather than in general use throughout the country where thoroughly sanitary work is done. When connected with a live chimney a local vent is of advantage, but unless the local vent pipe is heated or an outgoing current produced in some other way it would not serve any useful purpose.

Laying Copper Valleys.

From C., Mansfield, Ohio.—Through the columns of *The Metal Worker* I desire to thank those who so kindly answered my question on laying copper valleys, which appeared in *The Metal Worker* of February 5, and as soon as the weather permits I shall do this work as they suggest, all the answers being nearly alike. I have got many good hints from the Letter Box, and should an emergency arise where I can be of any assistance to those seeking information I shall only be too glad to offer my help.

Chimney Questions.

From A. W., Chicago.—Will you kindly inform me through *The Metal Worker* how a chimney 60 feet high should be constructed so as to produce the greatest amount of draft? Where a chimney is 14 x 9 inches inside measurement, running to the roof of building 50 feet high, and then enlarges to 14 x 14 inches inside for a distance of 12 feet above the roof, would this increase have any effect on the draft? If so, why? Would it be better to have it go all the distance 14 x 9 inches? In a properly built chimney 60 feet high what would be the effect upon the draft of each foot of increased hight?

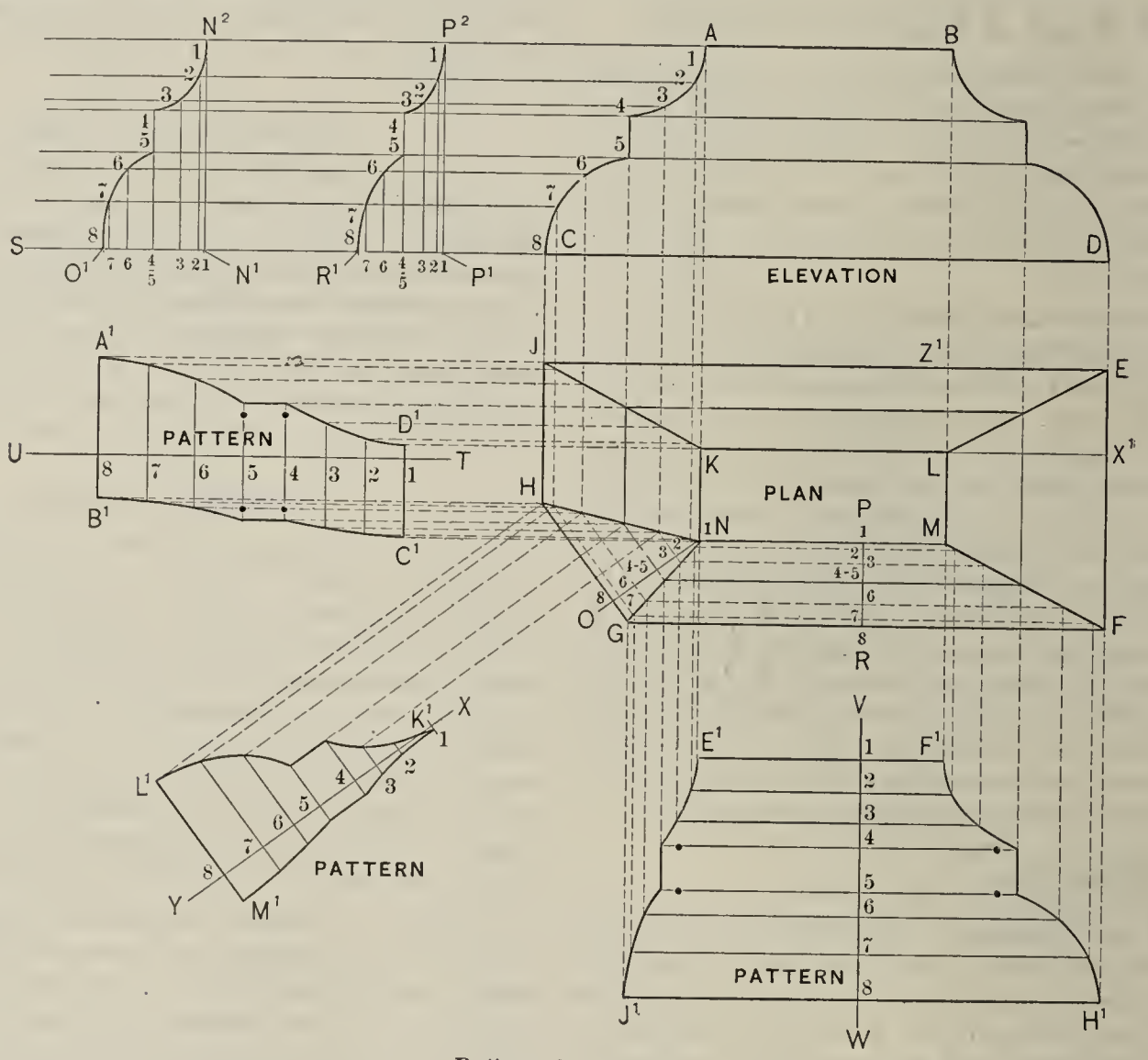
Answer.—A chimney to have the greatest efficiency should be so constructed as to have not only a smooth and regular interior wall surface, but should also have the least amount of wall surface for a given area. With this principle in view, it is found that a cylindrical chimney is the best, a square chimney next best, and rectangular chimneys of different dimensions decrease in efficiency with the greater difference in their dimensions. For example, a 12 x 12 inch chimney will have a stronger draft than a 6 x 24 inch, both having the same area. With the case our correspondent describes the chimney 14 x 9 has an area of 126 square inches, and the enlargement an area of 196 square inches. So great an enlargement gives a sudden check to the velocity of the gases up the chimney and adds nothing to the strength of the draft. If the upper section can be smoothly tapered to 14 x 12 at the top without detriment by the changed form, it will have a small increase in the strength of the draft by the additional hight. In larger chimneys an increase of about seven one-thousandths of the draft pressure has been realized per foot added.

A test was made last week at Fort Washington of the new Rayburn 10-inch fortification gun mounted at that point. Three shots were fired, each one reaching almost to Alexandria, seven miles distant, and the test, which was witnessed by the navy officials and a Congressional delegation, was regarded as highly successful. The gun, it is stated, can throw a shell 11 miles.

SHEET METAL WORK.

PATTERN FOR A MITER.

A correspondent in Lafayette, Ind., asks us to explain through *The Metal Worker* the method of developing the pattern of the adjacent miters to the triangle H N G in the plan inclosed, which we have reproduced in the accompanying illustration. A B C D is the elevation of the article, E F G H J the plan of the base, and K L M N the plan of the top, the miter line in elevation, corresponding with the line N G in plan, being omitted, as unnecessary in the development of the patterns. As every side has a different projection in plan, it will be necessary to obtain profiles for the various sides from which to obtain the stretchout for the development of the patterns. Divide



Pattern for a Miter.

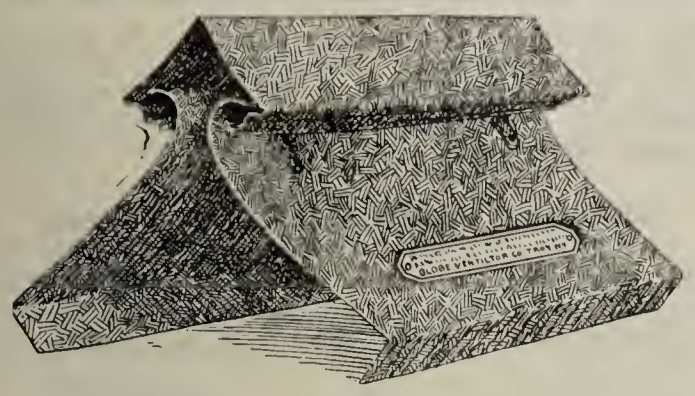
the profile A C in elevation, which represents the section on the line Z K in plan, into a number of equal spaces, as shown by the small figurers 1 to 8. From these small figures and at right angles to C D draw lines passing through the miter line J K in plan and intersecting the miter line H N. From the points of intersections on the miter line H N and parallel to H G draw lines intersecting the miter line G N ; then from these intersections and parallel to G F draw lines intersecting the miter line M F, as shown. Now at right angles to F G and G H draw the lines P R and N O respectively, intersecting the lines drawn from the profile A C. On the line D C in elevation, extended as D S, place a duplicate of the lines P R and N O, including the several points in each, as shown by P^1 R^1 and N^1 O^1 respectively. At right angles to C S and from the various intersections on the lines P^1 R^1 and N^1 O^1 draw lines intersecting those of similar numbers drawn from the profile A C parallel to C D. Trace a line through points of intersections thus obtained, as shown by P^2 R^1 and O^1 N^2 respectively. Then will R^1 P^2 be the out of the profile O^1 N^2, as shown by the small figures. At right angles to X Y and through the small figures draw lines, which intersect with those of similar numbers drawn from the intersections on the miter lines H N and N G of the plan at right angles to H G. Lines traced through the points thus obtained, as shown by K^1 L^1 and K^1 M^1, will be the required pattern.

For the pattern for that part shown by N M F G draw V W at right angles to G F, upon which place the stretchout of the profile R^1 P^2, as shown by the small figures. At right angles to V W and through the small figures draw lines, which intersect with those of similar numbers drawn from the miter lines G N and M F at right angles to G F. Lines traced through points thus obtained, as shown by E^1 J^1 and F^1 H^1, will be the required pattern.

For the pattern for that part shown by M L E F proceed in similar manner, obtaining the stretchout of the profile B D, which is the same as A C, and for the pattern for the part L K J E obtain the stretchout from R^1 P^2, because the projection L Z^1 is equal to P R.

The Globe Ventilated Ridging.

We have no doubt the members of the sheet metal trade will be interested in what is known as the Globe ventilated ridging, recently patented and now being introduced to the trade by the Globe Ventilator Company of Troy, N. Y. This ridging is designed to exhaust the heat



Globe Ventilated Ridging.—Fig 1.—*Style Known as No* 1.

from attics and ventilate residences, halls, churches, barns, &c., "without breaking the sky line or disturbing the artistic appearance of the building" in connection with which it may be employed. The manufacturers refer to the fact that the ridging can be readily applied to both old and new roofs without regard to the pitch. In the case of old buildings it is only necessary to cut back the boarding

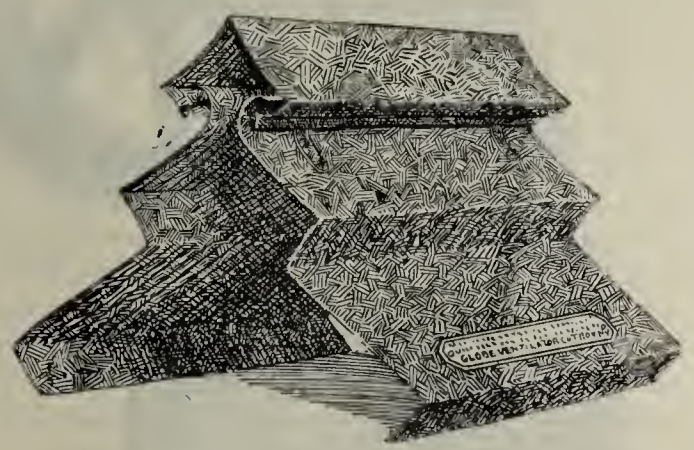


Fig. 2.—*Style No.* 2.

sufficient to allow for an opening of ½ inch on each side of the ridge pole, while in new work this space can without trouble be left ready to receive the ridging. Before being presented to the public the ridging was thoroughly tested by the manufacturers for over a year on several important buildings and found to be storm proof. It was in use during the severest weather of this and last winter, while at the same time it proved itself during the heated period of last summer to be an efficient ventilator under all conditions and circumstances, exhausting the heat from attics,

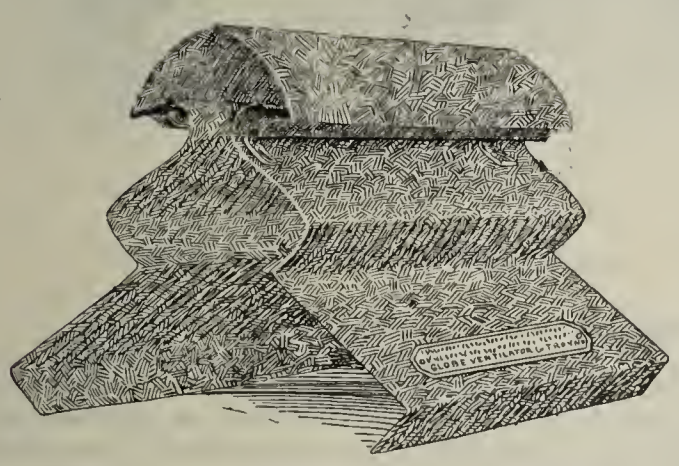


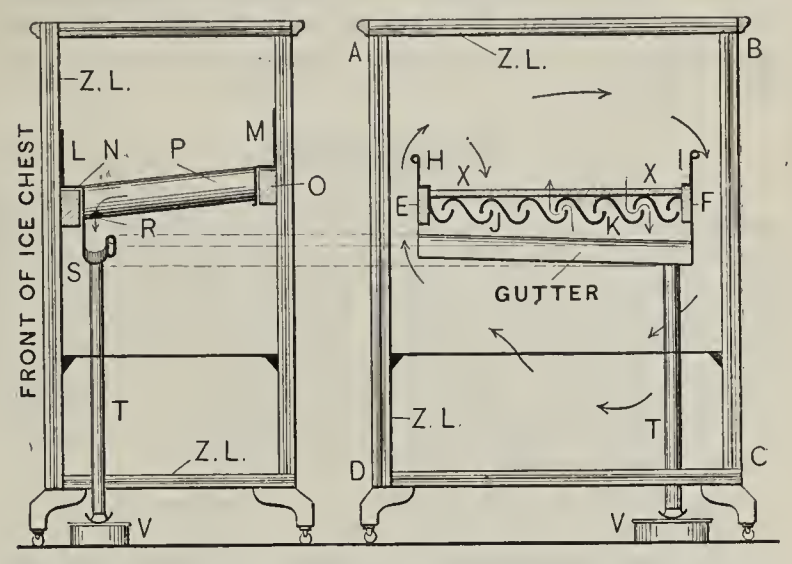
Fig 3.—*Style No.* 3.

rendering the upper floors comfortable and habitable, and preventing the roofs from sweating. The ridging is made in copper or galvanized iron, can be ornamented and provided with finials, and is offered in several different styles, some of which are shown in the accompanying illustrations. Fig. 1 represents a ridging 6 inches in hight, girt 14 inches and apron 3½ inches, while in Fig. 2 is shown a larger style, measuring 8 inches in hight, with a girt of 19 inches and an apron of 4 inches. In Fig. 3 of the engravings a ridging is shown 8 inches high, with a girt and apron the same as that indicated in the previous engraving. These styles are known as Nos. 1, 2 and 3, and the company request architects to so designate them when ordering.

COMBINATION VENT AND ICE PAN FOR REFRIGERATORS.

BY W. N.

The flat bottom ice pans usually employed in refrigerators are sometimes a source of inconvenience, owing to the dripping of the condensation forming under the pan. The ice being on the upper side, the warm air entering every time the door of the refrigerator is opened strikes against the bottom of pan, causing condensation and dripping below. In the cut are shown the front and side view of a louvered ice pan, which allows the warm air to circulate freely, thus keeping the top and bottom of the refrigerator at an even temperature. In the illustrations Z L indicate zinc linings. Let A B C D be the section through the refrigerator, E and F hard wood strips over which the frame of the pan H and I rests, and J K the louvered formed sections, fitting as shown, over which a wooden frame X X is set, on to which the ice is laid. The ice when melting drips into the gutterlike form at the bottom, follows the pitch of the louvers shown by



Combination Vent and Ice Pan for Refrigerators —Longitudinal and Vertical Cross Sections.

P, dripping out of the hole R, which is punched in every louver, into the gutter S, then following the pitch of the gutter into the tube T and out in the dripping pan V at the bottom. At N and O wooden strips are also screwed, on which the frame L and M rests.

Modern Improvement.

BY FOSSIL.

This article does not propose to spread itself, however thinly, over the topic of its title, nor refer to those advances of invention and construction which are comparatively of recent date. The writer has in mind an improvement rarely mentioned in print, and only noticed in the light of memory and experience. It is of parisitic nature, living on and ornamenting the tree of competition, and remarkable because of its apparently abnormal nature. There has been a marked change from the carefully guarded trade secrets of the time which some of us remember to the present days of reciprocal information, making a modern improvement which may be called craft courtesy. Looking backward to a tin shop apprenticeship, memory recalls an incident that may illustrate the difference between then and now. The boy wanted to get on in what was called in his indentures "the art and mystery of the trade," which meant simply instruction in manual operations. The art of constructing from patterns was taught him in course, but making without a pattern was a mystery and trade secret, held as personal property by those in possession and sold by them conditionally. Among the boy's desired attainments was how to lay out an elbow varying from a right angle, and he was not inclined to pay a journeyman for it. Taking a vessel of water, he set in a joint of pipe at the desired angle with the surface, and cutting the pipe on the water line he soon had the nucleus of a theory afterward developed by practice. Workmen of the present day having a similar "want to know" may take choice of various means for learning, and application to technical papers will furnish them with information "to burn." It is remarkable and equally satisfactory, as contrasted with old times, to note how a question appearing in the Letter Box of this paper seems to turn on lights of theory and experience from willing illuminators. This feature in connection with special books, which he who reads may run—his business by, may well be considered a modern improvement.

TINSMITHING SIXTY-THREE YEARS AGO.

We are in receipt of a letter from E. N. Hughson of Clyde, N. Y., and we will be glad to hear from any of his contemporaries telling of their experience in the old times when tinware was a hand product. Mr. Hughson's letter is as follows:

I notice in *The Metal Worker* of February 19 an article from John S. Brooks, who commenced his trade 53 years ago in Rochester, N. Y., at tinsmithing. Then all tinware was made by hand—so many articles for a day's work and 6 shillings for a day's work in our shop. Most always, however, we made 12 days' work per week, except on punched tin lanterns, which in our shop were considered a sack job (unless a compromise was made with the boss). The largest sheets of tin that we got at the time I started in my trade 63 years ago were 10 x 14 inches. We had to make pail ears, pits, every article, in fact, right from the stock. I can see a great change in the past 63 years in the manufacture of tin, iron and copper, which I have worked ever since I commenced my trade. I am still in my shop enjoying the fruits of a long apprenticeship, and hope to remain there many years more. Next.

FLASHINGS.

Under date of March 1 the announcement is made that the Niagara Stamping & Tool Company, Buffalo, N. Y., have changed the firm title to the Niagara Machine & Tool Company. This change is due to the increasing demand for their tools, which has made it necessary to devote their entire plant to the manufacture of tools and machines and discontinue the stamping line which they formerly followed. They will continue the manufacture of Tinsmiths' Tools, including Squaring and Rotary Shears, Presses, Dies and special machinery.

Powers Brothers, Streator, Ill., are now manufacturing two styles of Powers Brothers' Automatic Chimney Top Castings, the second style being much lower in price and brought out to meet the demand for a cheaper article.

Trouble is apprehended in the metal roofing and galvanized cornice trade in Chicago owing to disagreements between employers and workmen relative to the limitation of apprentices, wages for overtime and holidays and other questions. It is to be hoped that everything can be settled amicably.

John Scott, who had been the proprietor of an Ornamental Cornice works in Allegheny, Pa., for many years, died in that city on February 21, aged 71 years. He was born in Belfast, Ireland, and came to Philadelphia at an early age, moving to Allegheny over 50 years ago. Mr. Scott is survived by his widow and four children.

Catalogue D for 1898, issued by the St. Paul Roofing, Cornice & Ornament Company, St. Paul, Minn., is an interesting pamphlet of 50 odd pages, illustrating the class of work done by this well-known concern, whose business is the manufacture of Metal Fronts, Siding, Roofing, Patented Fire Proofing and Sheet Metal Building Materials. Those who are interested in Steel Ceilings should send for their catalogue C, 1897, while Pressed Zinc Ornaments are the subject of their special catalogue of 1895. The first 30 pages of the volume at hand show the wide adaptability of their Metallic Fronts for renovating old buildings and for covering new ones. A remarkable instance is shown by two half-tone engravings on page 3, where an old fashioned brick city house has been altered into a very modern looking structure. Other half-tone engravings show all sorts of stores and public buildings finished with the metal coverings made by this concern and illustrate the great variety of artistic effects produced. The latter pages of the pamphlet illustrate and give prices of Cornices, Window Caps, Ornaments, Skylights, Ridge Rolls, Iron and Steel Roofing, Metal Shingles, Eave Troughs, Conductor Pipe, Crestings, &c.

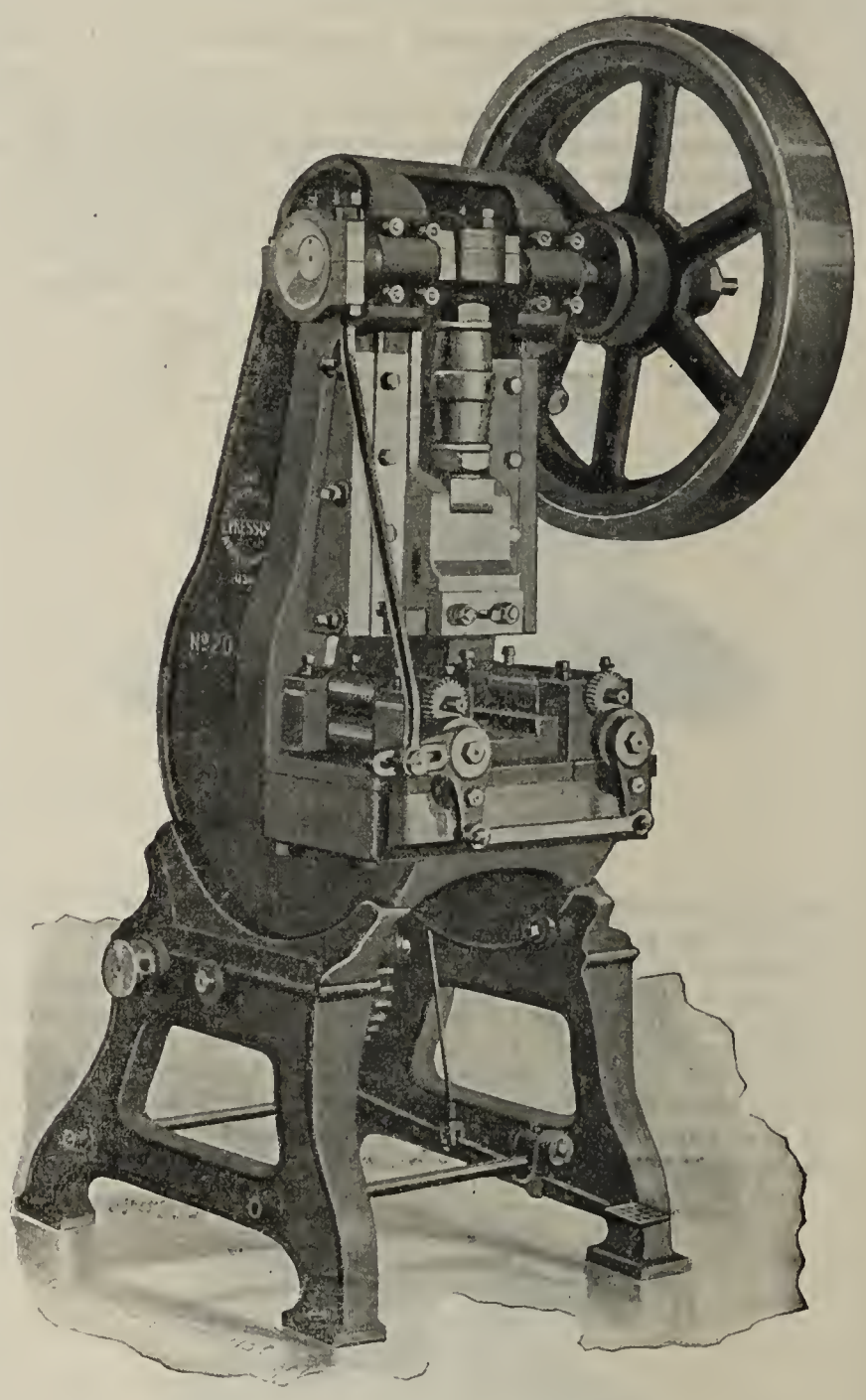
The Double Truss Cornice Brake Company, Buffalo, N. Y., are having a demand for their goods from the uttermost parts of the earth. In addition to their local trade they have recently made shipments of their well-known Double Truss Brakes to British Columbia, Texas and Mashonaland, Africa. The latter shipment had to be carried 400 miles inland, which, the manufacturers state, shows that their improved Brake gives excellent satisfaction and that advertising pays.

The property of the Los Angeles Iron & Steel Company, Los Angeles, Cal., has been sold under foreclosure proceedings to R. H. Herron & Co., local oil machinery and supply merchants. The nominal sum of $150 was paid, the property being still subject to a bonded indebtedness of $30,000 and $2000 due for taxes. The plant consists of sheet rolling mills, with corrugating and galvanizing departments, and cost about $120,000. The working capital was too small, and the hard times caused a collapse. Los Angeles has an abundant supply of native oil for fuel, the local demand for Sheets is excellent, and the purchasers of the plant are hopeful of inducing practical iron men to take hold of it and resume manufacturing.

The American Corrugating Company, St. Louis, have just shipped a carload of Corrugated Iron to Omaha, to be used on the power house of the Trans-Mississippi and International Exposition, which will shortly be opened in Omaha, Neb.

The Stiles Adjustable Incline Press.

The new press built by the E. S. Stiles Press Company of Watertown, N. Y., is fitted with double roll feed for automatically feeding the sheet metal, paper, &c.;



The Stiles Adjustable Incline Press.

for forming, cutting, stamping, &c. The stock is fed from left to right, first from the right hand rolls beneath the dies and then to the left hand rolls which carry away the scrap. The driving mechanism for the rolls is new in design and very simple in construction. An eccentric on the end of the main shaft carries the connecting rod, which is fastened to the feed arm of the left hand set of rolls. By employing this eccentric and connecting rod the necessity of an intermediate rocking arm is obviated, thereby reducing the number of working parts of the feed and producing more accurate work. The feed arm is slotted, thereby permitting adjustment of the connecting rod, which, in connection with the eccentric, which is also adjustable, allows very accurate setting of the length of feed. The rolls are driven by triple pawls, thus insuring at least one or more teeth at all times in mesh with the ratchet wheels. The dies and punches can be easily adjusted or removed without disturbing the feed mechanism. The principal dimensions of the machine are: Diameter of rolls, 3 inches; width of rolls, 6 inches; distance between rolls, 13 inches; range of feed, 0 to 3 inches; hight over all, 84 inches; floor space occupied, 37 x 38 inches, and weight complete, 2800 pounds.

HEATING AND PLUMBING.

How to Do Good Plumbing.

BY A. P. C.

There are still many in the plumbing trade who are of the opinion that there is little necessary to learn after they have either mastered the art of wiping a joint or have hired a man who has. Men who are no better equipped than this should never undertake to connect a fixture with a house drain, for they are liable to arrange their work so that it is a menace to health and just the opposite of what it should be. We assume that no man would willfully execute work so that it is dangerous, and when it is done so it is done in ignorance. To prevent such dangers is the object of the united efforts of the plumbers all over the country in securing State and local legislation to regulate the way plumbing work is done, to inspect the work and to examine those who do it and give certificates of competency.

Those who wish to become informed on this subject will do well to get the plumbing ordinances of several prominent cities and study the requirements of each section until the reasons for the provisions are well understood. This will occupy many evenings if conscientiously and thoroughly done. It will require much questioning and many conversations with plumbers, inspectors and those in the trade as well as a careful reading of papers and books devoted to the subject. There is no book that takes up the plumbing trade and treats it like a story that begins at the beginning and runs smoothly in story fashion to the end so that the reader will know the whole plan and practice from start to finish. With a good set of plumbing regulations for a base plan and a disposition to study, the man who desires to learn all about plumbing will read and will then find something in all he reads that he can appropriate to his own use. He will place a higher value on drawings, sketches and plans and may cultivate the art of making them. If he studies with interest and questions freely he will soon get a good idea of the principles governing the arrangement of soil, waste and vent pipes. When he thoroughly understands the theory of plumbing and is able to apply it in practice with careful workmanship, he need fear no examining board in existence, but he should never cease studying. In the last 15 years plumbing work has been greatly advanced, and an era of further progress is now at hand. Plumbing work is done better to day than ever before in some sections, and the effort to have it equally well done everywhere may be seen in the laws submitted for enactment by those who have the best interest of the plumbers and the public at heart.

Illinois State Plumbers.

The annual convention of the Illinois State Association of Master Plumbers closed its work on February 24 at Ottawa, Ill. The reports of the officers showed that the association has a membership of 864 and a balance of $1000 in the treasury. The next convention will be held in Galesburg. Officers elected for the coming year are:

President, W. W. Murphy, Peoria.
First Vice-President, Ed. C. Hall, Springfield.
Second Vice President, P. J. Crane, Alton.
Secretary, Arthur J. Ancliff, Peoria.
Treasurer, John G. Roland, Chicago.
Delegates to National Convention: J. M. Dougherty, Ottawa; Charles Law, Earlville.
Member of Interstate League, L. B. Davis, Rockford.

M. W. Edgar has purchased the business of Herbke & Co., plumbers, at 128 Shelby street, Detroit, Mich.

New York Board of Examining Plumbers.

The end of last week Mayor Van Wyck of New York appointed the following as a new Board of Examining Plumbers: George B. Brown, 231 Lexington avenue; John Rennehan, 1291 Madison avenue, master plumbers, and James E. McGovern, 1844 Park avenue, journeyman plumber. This board will prepare the questions and examine applicants for certificates to take out licenses to carry on the plumbing business in New York City. The members of the board receive a compensation of $10 a day when they are in session.

How to Figure Heating Surface of a Greenhouse.

In the new catalogue of steam and hot water boilers made by Abendroth Bros., New York, is the following information for determining the amount of surface required in greenhouse heating:

In figuring a greenhouse, we have to deal entirely with exposed surface, cubic contents rarely, if ever, being taken into account; therefore, the entire amount of glass exposure and its equivalent should be determined, and in doing this the ends and side walls should be figured just as surely as the overhead and end glass. The sides and end walls, if of wood, sheathed and papered good and tight, should be figured in the following proportions, viz.: Five square feet of wall to 1 square foot of glass.

After obtaining the number of square feet of glass and equivalent, the next point is the proper amount of heating surface necessary, and this is dependent upon the temperature required in the greenhouse. The following proportions of glass to heating surface will be found fairly accurate.

	St.	H. W
To a temperature of 40 degrees, divide number of square feet of glass by	9	6
To a temperature of 45 degrees, divide number of square feet of glass by	8	5
To a temperature of 50 degrees, divide number of square feet of glass by	7	4
To a temperature of 55 degrees, divide number of square feet of glass by	6½	3¾
To a temperature of 60 degrees, divide number of square feet of glass by	6	3½
To a temperature of 65 degrees, divide number of square feet of glass by	5½	3¼
To a temperature of 70 degrees, divide number of square feet of glass by	5	3

The above is based on an outside temperature of zero.

Albany Master Plumbers.

The Master Plumbers' Association held a meeting February 22 and elected the following delegates to attend the annual convention of the State Association of Master Plumbers, which will be held at Binghamton, N. Y., March 8 and 9: J. H. Russell, T. E. Kerwin, J. E. James. State Vice-President H. F. Westcott and Local President J. E. Dugan will attend the convention by virtue of their office as *ex-officio* delegates.

The alternates chosen are J. H. Moran, J. J. Britt and F. F. Schimpf.

J. H. Moran, A. Gilmour, Jr., and T. E. Kerwin were elected delegates to the national convention of master plumbers, to be held at San Antonio, Texas, on April 13, 14 and 15.

Plumbing Supplanting Slumming.

Not slumming, but "plumbing" is the latest and most fashionable diversion in New York, says the *Sun*. The plumbing does not consist in laying or repairing the pipes and mains, but in inspecting and criticising them. There is, of course, a guide or leader who first picks out some houses where things are peculiarly defective, and who then pilots the party about, pointing out how dreadfully unhygienic it all is. Most of the inspecting crowd probably know no more about it when they are through than when they began, but the diversion has the air of being philanthropic, not to say scientific, and it is certainly novel. There was a "plumbing party" on hand yesterday. It was made up of the rank and file of the New

York Household Economic Association (none of the important members being present), and it left the Palace of Industry at 3 o'clock About 20 women were in the crowd, and it was in charge of Charles F. Wingate. As the one man and the whole crowd of women made their way along the streets it was interesting to observe the stares and the comments of the passers by who were not yet familiar with the "plumbing party." Not until the new diversion becomes more common may we expect the general public to be callous to it. The party tackled a house on East Sixty-third street and proceeded to examine its drains. Mr. Wingate was very particular to point out the importance of the right sort of traps, and the women were soon converted to his opinion. The questions the women asked were remarkable and varied. They ranged all the way from queries as to the proper size for butlers' pantries to interrogations concerning the high price of putty in New Orleans. Mr. Wingate was both patient and painstaking, however, and tried his best to make everything clear. There is no doubt, too, that the new diversion contains much of practical value to those who enter into it in the proper spirit. The slumming party was nothing more than a gratification of curiosity; the plumbing party provides a capital object lesson in that most important field—domestic science.

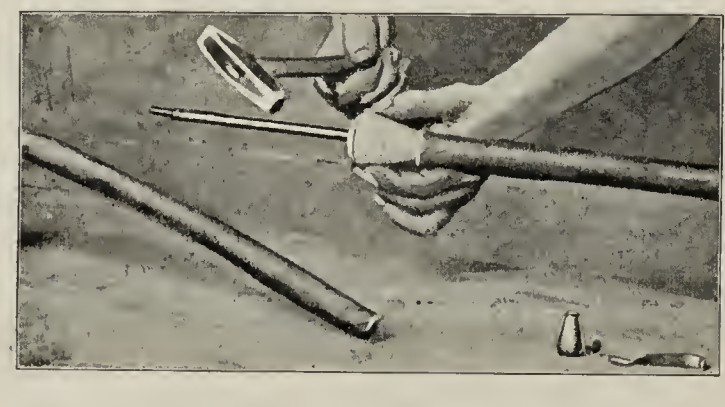
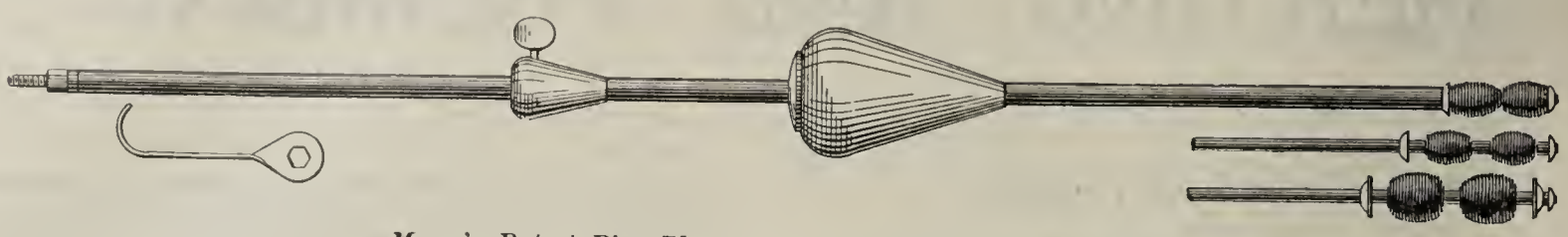


Fig. 3.—Expanding Pipe with Hollow Tampion.

James McCrea & Co., Chicago, Ill., have opened an office at 54 John street, New York, under the management of L. Stary, for the sale of the Climax Steam Clamp Joint. This device is intended for stopping leaks due to faulty threads in pipe or fittings without the labor and expense of taking them out and replacing them.

Moore's Patent Pipe Plug.

In the accompanying illustrations we show Moore's patent pipe plug, made by John F. Moore & Brother, Terre Haute, Ind., with which, it is claimed, a joint in a lead pipe can be made while the pressure is on. In



Moore's Patent Pipe Plug.—Fig. 1.—The Plug for Lead Pipe.

Fig. 1 we present a view of the pipe plug, which consists of a hollow shaft through which a rod passes for expanding the rubber bulb which is placed on the end of the shaft, different sizes of rubber bulbs being supplied for different sizes of pipe. Where a leak occurs in a pipe from any cause and it is necessary to repair the leak without shutting off the water supply, or where there is no provision for shutting off the water supply, it is claimed that by the skillful use of the Moore pipe plug the pipe can be repaired without the workman getting wet. It is suggested that the pipe be cut off with a saw, a cloth being laid over the top of the saw, preventing the water splashing on the workman. As soon as the pipe is severed the plug is inserted in the end, as shown in Fig. 2, and the little wrench shown at the left of Fig. 1 is used for expanding the rubber bulb. After the expansion of the bulb stops the flow of water the hollow tampion can be slipped over the hollow

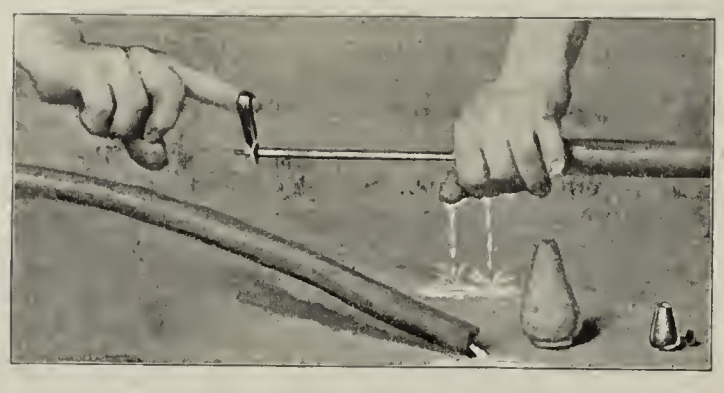


Fig. 2.—Expanding the Bulb After Insertion.

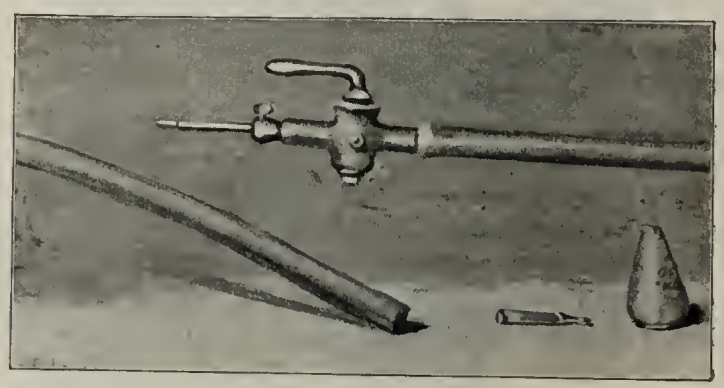


Fig. 4.—Holding the Stop Cock for Wiping.

shaft and used for enlarging the end of the pipe to receive the stop cock, as shown in Fig. 3, after which the end of the pipe is prepared for wiping in the usual way. The stop cock is slipped over the shaft and by the use of the thumb screw is held securely in place, as shown in Fig. 4, while the joint is being wiped. Then, on withdrawing the shaft and the rubber bulb through the stop cock, the stop cock can be closed, shutting off the water until the joint is wiped on the other end connecting the pipe and the stop cock, so that a continuous line is made. These plugs have been used in various parts of the United States with great satisfaction to the operators. In Fig. 5 we show the device as used for gas piping. It is pointed out that a workman can sever a pipe, insert the plug, then thread it and make all the necessary connections without the loss of any considerable amount of gas or the danger of asphyxiation. It is of special utility where pipes have been broken through accident in new buildings or in the streets by paving, sewer construction or other municipal improvements. A catalogue giving full instructions for use and pictures of the process of application will be sent to those who write for it.

Now that the gas companies lock the meters in houses when the gas is shut off for non-payment of bills, says a Chicago paper, an ingenious plan has been devised for beating the company. "I want a yard of rubber hose," said a customer in a rubber store the other day. "For gas or water?" was the query. The customer was indignant, but the clerk said afterward that rubber hose was extensively used in making "merry-go-rounds" to obtain

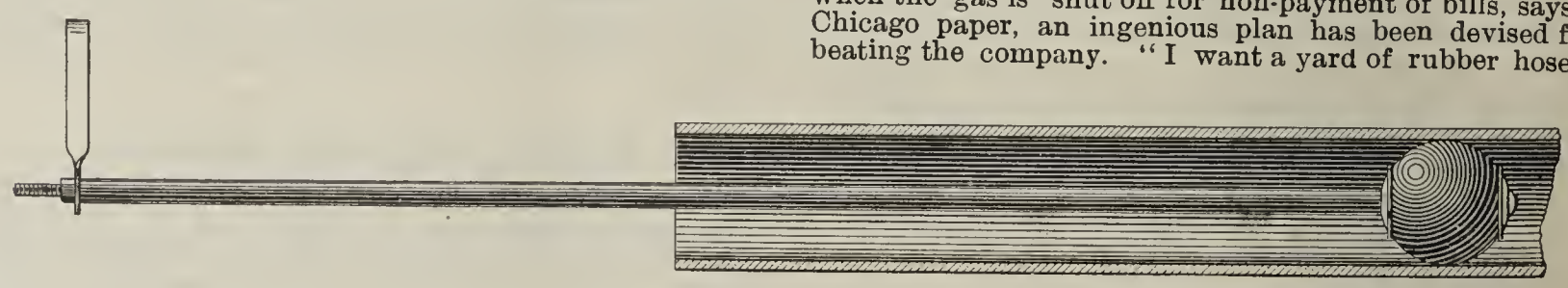


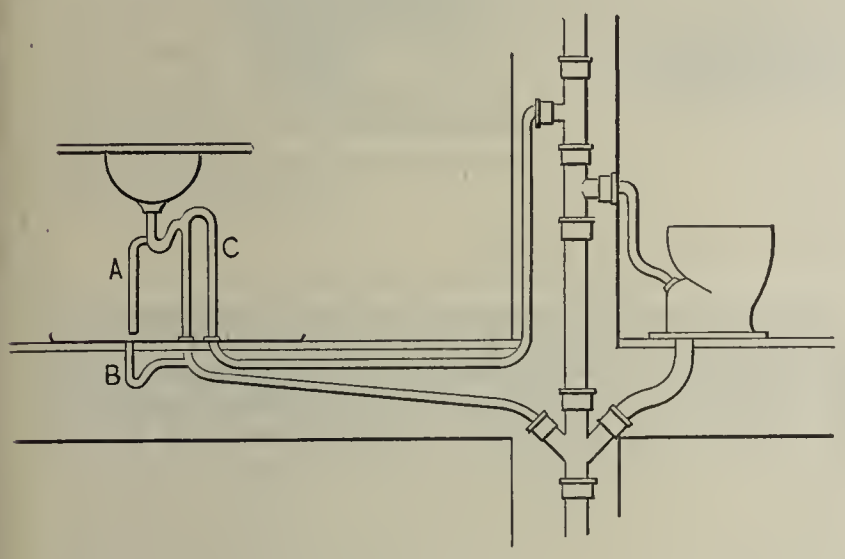
Fig. 5.—The Plug for Gas Pipe.

gas free. As every one knows, gas goes into the meter through one pipe and comes out through another. One end of the rubber hose is attached to the lower pipe and the other end fitted to the upper pipe. Thus the meter is entirely avoided. The gas company estimate that they lost $100,000 in the last year in this manner.

Destroying the Efficiency of a Vent Pipe.

BY J. D.

The plumbing which is done so as to reflect the most credit so far as workmanship is concerned is often so arranged as to entirely frustrate its object, and in some instances the work becomes positively dangerous. I submit herewith a sketch of some plumbing work which I recently found in a building. Owing to the location of the lavatory it was difficult to carry the vent from the trap up and over to the soil stack. In consequence it was taken from the top of the trap and carried down to the floor and run across under the floor to the soil stack, where it rose to a point above the highest fixture and was connected with the soil stack. If this pipe could have been kept clear it might have performed some of the functions of a vent pipe, although the number of turns in it would have added greatly to the friction of air passing and might have prevented an influx of air with sufficient rapidity to prevent the trap of the lavatory being siphoned when the water closet connected with the same stack



Destroying the Efficiency of a Vent Pipe.

was flushed. The workmanship throughout was, however, above criticism.

The plumber had also provided a safe waste under the lavatory so that in case it should overflow from any cause instead of flooding the building the water would be caught in the safe waste and pass off. The outlet from the safe waste, however, was a comparatively small pipe arranged with a trap in it and connected with the waste pipe from the lavatory. The plumber had realized that it was possible that the water in the trap at B would be very likely to evaporate and would need replenishing. To provide water in the trap a pipe was connected with the waste in the lavatory as shown at A, so that when the lavatory was discharged some of the water would pass down A into the safe waste and from it to the trap B. He did not realize that by discharging water from the lavatory the trap B would invariably be siphoned and that no water would remain in it, which was the condition that brought this piece of plumbing work to my notice. The odor found in the room was unbearable and my services were sought to remove the cause. On examination I found it to be as shown in the drawing. I disconnected the pipe A entirely and carried a pipe from the safe waste to the kitchen, where I arranged for it to discharge in case of an accident or overflow into the kitchen sink. To prevent odors from the kitchen passing up this pipe I turned the end horizontally at the bottom and placed on it a flap valve which would in no way interfere with the discharge yet would close the end of the pipe and prevent air currents and odors passing through it. The pipe C I found to contain filthy water up to a point 3 inches above the top of the horizontal part, so that it was utterly impossible for air to pass through it to prevent siphonage. I disconnected the pipe entirely and owing to the construction of the building carried this vent pipe up through the building and above the roof independent of any other stack of pipe. I closed the opening in the soil stack to which it had been formerly connected.

The system has now been in operation for some time and the disagreeable odors have disappeared, and when the water closet is discharged it is found that the seal of the trap of the lavatory is no longer affected by the discharge. From the fact that the workmanship in this case was good it shows that it must have been done either by a young man who had yet a great deal to learn about plumbing or by an older workman who had done the work as he was told regardless as to whether it would be sanitary or not. It also points out the advisability, if not necessity, of filing with proper officials a plan of all work that is to be done and an inspection of the work after it is completed. It is safe to say that the plan for such a piece of work would never have been passed by any health official or plumbing inspector, and had the work been examined by an inspector it would have been condemned and the changes which I have made would have been ordered.

The Electro Gas Company.

The Electro Gas Company of New York are having built a plant for the manufacture of all kinds of lamps for the exclusive use of acetylene gas and the cartridges with which they will be charged. This plant is being built on the property of the Niagara Falls Power Company, at Niagara Falls. The building is to be of frame, two stories high and 50 x 100 feet at the foundation. It is understood that the Electro Gas Company are building it for a company that will put the theories and experiments of that company into practical use and introduce them to the public. The cartridges will be made of various sizes to fit lamps for household use, lamps for bicycles, carriages, lanterns, &c. The calcic carbide for loading the cartridges will be obtained from the factory of the Acetylene Light, Heat & Power Company, which stands close by the new plant, and thus all expense of freight will be done away with in carrying the carbide to the new factory. For several months the Electro Gas Company have been experimenting with the carbide cartridges, and all these experiments have been so successful as to cause the company to hasten to get their new product on the market, where it is expected to meet with a satisfactory reception by the people. If the lamps prove as successful as they are predicted to be, they will supplant oil lamps in many homes. The acetylene lamp will be cleaner than one burning oil, and it is said they will be cheaper while giving a much better light with no danger of an explosion. Furthermore, portable lamps burning acetylene will do away with the necessity of piping a house in order to use gas, which of itself will be an item of expense many would be glad to save.

Abendroth Bros.' Boiler Catalogue.

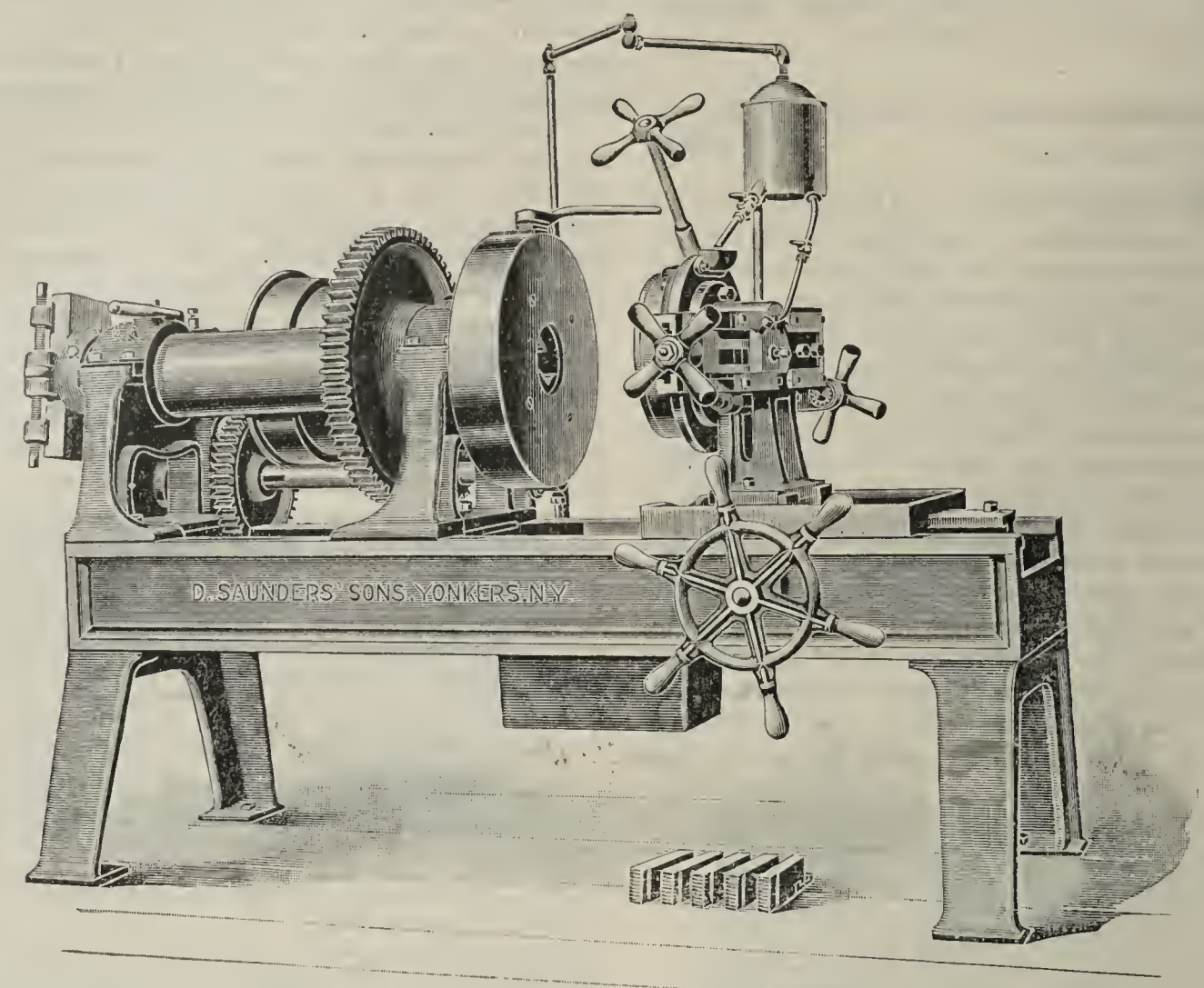
Catalogue No. 20 is just received from Abendroth Bros., 109-111 Beekman street, New York City, bound in maroon covers, with the address of the house on the front cover in gilt and their trade-mark in gilt on the back cover. The catalogue is devoted to the Abendroth sectional hot water and steam boilers. The first page shows a view of their foundries at Portchester, N. Y. The title page is followed by a half-tone engraving illustrating a group of their boilers Half-tone engravings showing broken views of their boilers are interspersed among the desciptive matter. The views give a correct idea of the arrangement of the return flues and the fire travel. The descriptive matter is followed by tables giving full dimensions and data and ratings of the various boilers. Some useful information is included in the catalogue in reference to the sizes of the mains, method of figuring radiation for heating buildings and also for heating greenhouses. The last two pages of the book are devoted to the Little Gem hot water heater, adapted for supplying hot water for hotels, apartment houses, laundries, &c. The catalogue is accompanied by a circular devoted to the O S distributing fitting for hot water work, made by Oliver Schlemmer of Cincinnati, Ohio.

The Judson A. Goodrich Company, 228 Water street, New York, are displaying in their show window some of their high grade steam specialties. A Pump Governor and a Reducing Valve of large size attract considerable attention.

The Saunders Pipe Threading and Cutting Machine.

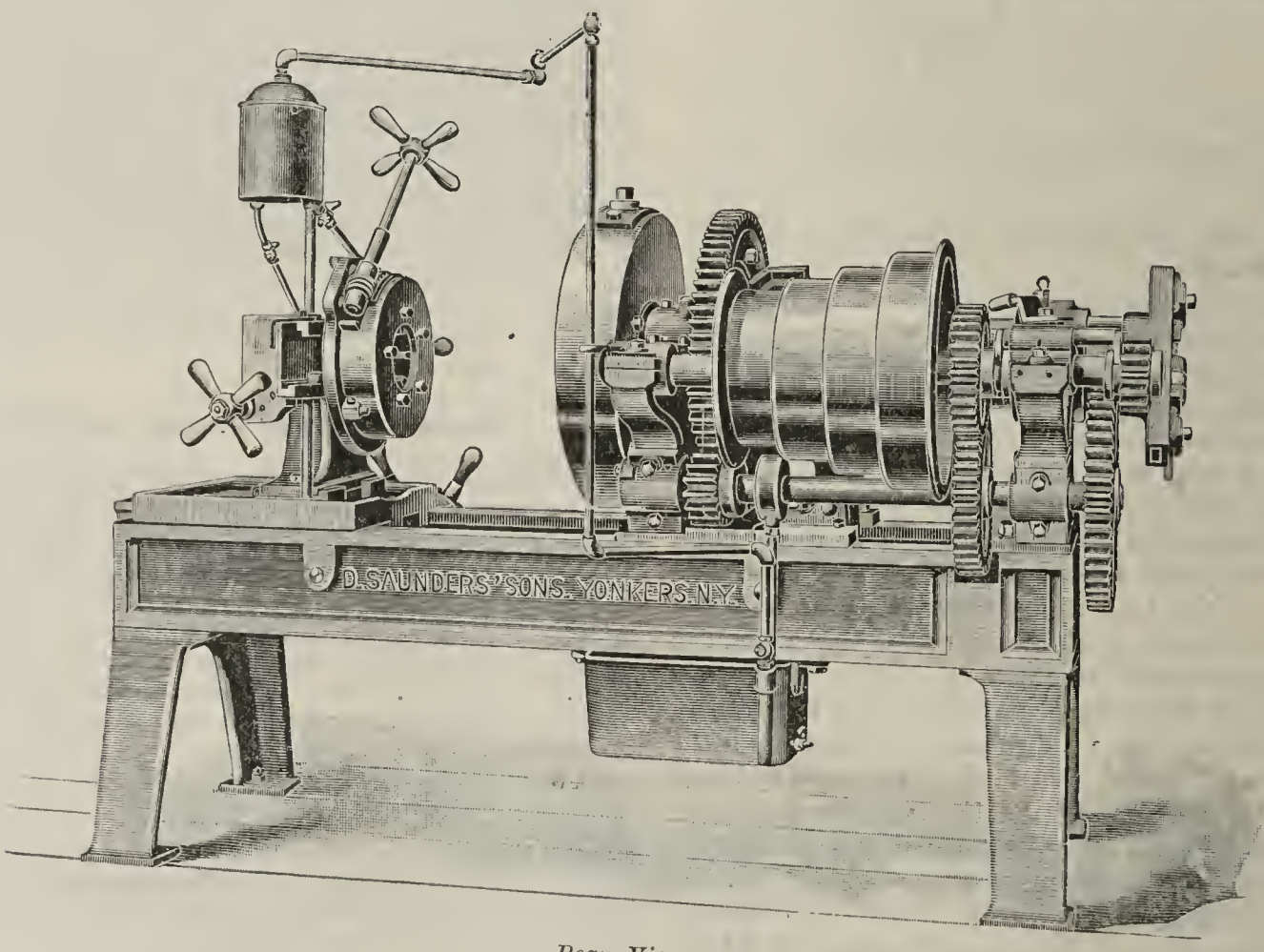
The belting and gearing of the improved pipe threading and cutting machine built by D. Saunders' Sons, Yonkers, N. Y., have been arranged with the view of obtaining suitable power and speed for the various sizes of pipe.

The die head, shown in place on the machine, is of the adjustable expanding style, operated by cam movement, to open and close the chasers. The die head and head to which it is attached are so constructed that pipe may be alternately threaded and cut off without removing the die head from the machine. The die head, being on front of the cutting head, can be brought close to the gripping chuck, and short pieces of pipe may be threaded. This advantage often saves the use of a nipple socket. When the pipe is to be moved to adjust it for cutting off the die head is pushed to one side on ways, allowing the pipe ample room to pass through the cutting head without passing through the die head, to the injury of the chasers by sliding the pipe over them, which is the case when the die head is held stationary in the center of the ways of the machine.



The Saunders Pipe Threading and Cutting Machine.—Front View.

The No. 3 machine has two die heads, one threading ¼ to 2 inches, the other 2½ to 3 inches. The No. 4 also has two die heads, one threading 1 to 2 inches, the other 2½ to 4 inches. By having two there is less changing of the chasers, loss of time in changing and less cost for extra chasers for the small sizes. When the small die head is used the large one is pushed to one side, allowing ample room for the small die head to be brought to the center. The large die head remains on the machine. The cutting off tool is conveniently placed. Two hardened steel V jaws, self centering, are used for steadying the pipe while cutting it off. They are operated by a hand wheel and right and left hand screw, centering the pipe.



Rear View.

The universal gripping chuck for holding the pipe is strong and well fitted. On the rear of the spindle there is a self centering two-jawed chuck for steadying the pipe. An automatic oil pump is attached to keep a constant flow of oil on the chasers and cutting off tool.

Peck Bros. & Co.

Peck Bros. & Co., New Haven, Conn., are again in possession of their large plumbing goods manufacturing plant. At the receiver's sale on March 2 a representative of the stockholders bid $265,500 and secured the plant and assumed the unpaid claims that had not been disposed of by the receiver. The friends of the house will be glad to learn that the management of their affairs is again in their own hands and will join us in wishing them a prosperous future.

Massachusetts Plumbing Inspectors.

Thirty members of the Massachusetts Association of Plumbing Inspectors were present at the quarterly meeting held at the Quincy House, Boston, Mass., on Tuesday. Dinner was served at 2 o'clock, previous to which a business meeting was held, at which the president, D. F. Callahan of Marlboro, was in the chair. Interesting papers on "Sanitary Plumbing" were contributed by John F. Bresnahan of Fitchburg and Henry H. Wilcox of Taunton, and these were followed by a general discussion on plumbing laws.

Another matter that came up for consideration was the advisability of forming a New England Association of Inspectors of Plumbing. Most of the New England States have State associations, and there has been more or less talk about the formation of an association which will be composed of all the different State organizations. This matter will probably be brought to a head at a meeting to be held at Worcester some time in June.

A Chicago Consolidation.

Peck Brothers Company, 65 Market street, Chicago, jobbers of plumbing supplies, have purchased the business of the Lehner, Johnson, Hoyer Mfg. Company, 68 to 74 West Monroe street, Chicago, manufacturers of brass goods and also jobbers of plumbing supplies. The consolidated business of these two houses will be conducted under the name of Peck Brothers Company. It will be arranged so that the jobbing trade will be handled at 65 Market street, and the West Monroe street house will be used only for manufacturing. The Lehner, Johnson, Hoyer Mfg. Company have been running a branch store at 4736 South State street, Chicago, and it will be continued at least until May 1. Peck Brothers Company have an exceedingly attractive store at 65 Market street, with not only ample space, but fine opportunities for displaying goods. They will take a much more prominent position in the trade hereafter, through their control of a manufacturing department. The officers of the company are as follows: President, O. D. Peck; vice-president and factory superintendent, J. H. Johnson; general manager, A. D. Sanders; secretary and treasurer, W. A. Radcliffe.

Catalogue of Roberts Machine Co.

We have received through the courtesy of Vice-President George B. Cobb of the Roberts Machine Company of Collegeville, Pa., a copy of their latest catalogue in reference to the Roberts safety steam and hot water heaters. The first 15 pages contain an interesting treatise on what a house heating boiler should be. This is followed by detailed descriptions and cuts of their round self feed and also surface burning boiler and their vertical sectional boiler. Sectional views are used showing the construction. A special view shows the method of making a joint between two castings of the Roberts boilers. Tables are presented giving the grate surface, fire surface and flue space contained in their boilers, together with dimensions which are necessary to the heating contractor. The last pages are devoted to thermometers, expansion tanks, automatic water feeders, dampers, regulators, gauges and fittings for use with the upright boilers for connecting a number of heating mains. Accompanying the catalogue is a sheet giving a number of testimonial letters from those who have used Roberts boilers with gratifying success.

H. Gilbert Hart of the Hart & Crouse Company, Utica, N. Y., was in New York this week and visited W. M. Mackay, manager of their steam and hot water department, at 235 Water street.

Pennsylvania Association of Master Plumbers.

On Tuesday, March 15, 1898, at 9 o'clock a.m., in the hall of the Monongahela House, corner Smithfield and Water streets, Pittsburgh, Pa., will convene the fourth annual convention of the Pennsylvania Association of Master Plumbers. Former conventions of this association have proven deeply interesting, not alone to plumbers of Pennsylvania, but to all plumbers throughout the land, and this convention promises to be no less interesting than any that have preceded it.

NOTES.

Fred. C. Worthington, Westfield, Mass., has purchased the plumbing and gas fitting business of George H. Farrell.

A bicycle man of Oakland, Cal., who is expert in repairing punctures in tires, has, it is reported, been arrested for violating the plumbing regulations in repairing the punctures in the various pipes of a plumbing system in a residence.

S. Stille, Escanaba, Mich., is exhibiting in his plumbing establishment the Ransom Gas Machine, which is adapted for lighting residences and other buildings with a gas generated from gasoline.

The city of Chicago has been non-suited in an attempt to collect a fee for inspecting a low pressure house heating boiler. The city will sue again, and the owner, it is said, will carry the case to the Supreme Court.

L. P. Smith, Camden, N. Y., has added a tinning and plumbing department to his hardware business and has secured the services of C. M. Nesbit of Hammond, N. Y., who has already begun work.

W. H. Coopman, for some years past advertising manager for the Ahrens & Ott Mfg. Company, Louisville, Ky., resigned his position March 1, and is succeeded by W. B. Gray, formerly associate editor of *The Sanitary Plumber* and well known for his contributions on plumbing topics to the trade press.

At the regular weekly meeting of the Master Plumbers' Mutual Protective Association of Baltimore, Md., a constitution and by-laws were adopted. It was stated that arrangements were completed whereby the members of the association can buy their materials at wholesale prices on the co-operative plan, the members agreeing not to patronize the Baltimore dealers.

On recommendation of the Examining Board of Plumbers, the Board of Administration of Cincinnati, Ohio, has granted master plumbers' licenses to John Ring, E. H. Mueller and James McIntyre.

A. J. Marks has opened a plumbing shop at 315 Cambridge street, East Cambridge, Mass. Mr. Marks will also carry a full line of Hardware.

A fire doing a damage of $3000, covered by insurance, visited the plumbing establishment of H. H. & S. H Avery, at Jackson, Mich., last week.

F. W. Sleep of Thomas G. Oakes & Co., 54 John street, New York, has recently returned from a visit to the factory at Greensburg, Pa., where their line of Acorn Valves are made.

C. M. Lyman, one of the salesmen of Russel Wheeler & Co., Utica, N. Y., visited the heating trade in New York this week in the interest of the Palace King and Palace Queen line of Hot Air Furnaces and Steam and Hot Water Heaters.

The R. T. Connell Plumbing Company were sufferers from fire in the Badger Block, at St. Joseph, Mo.

Jacob Taylor has opened a plumbing shop in Sweney Building, Chester, Pa.

The Boston house of the Henry McShane Mfg. Company, Baltimore, Md., had a fire doing $200 damage on Tuesday morning.

Chas. M. Cantieny and Elmer Tuttle have purchased the shop of W. B. Chaney & Son, Lima, Ohio. The new firm will be known as Cantieny & Tuttle.

Edward R. Monihan, representing Robt. K. Story, 44 Centre street, New York, is finding an increasing demand for the Detroit Valves and the Marsh Air Valves and Illuminated Gauges with the opening of the spring trade among the fitters.

March 16 has been set as the date for the holding of the convention of the steam fitters of the State of Connecticut, of which previous notice has been made in *The Metal Worker*.

F. W. Wagner, 313 South Clinton street, Syracuse, N. Y., celebrated Washington's Birthday by having a small conflagration in his plumbing shop.

John E. Harbison, who has been the Plumbing Inspector of Schenectady, N. Y., ever since the office was created, has turned over his office to his successor, Lewis Friday. Mr. Harbison has associated himself with John Hill of the Albany Business School, and will soon open a plumbing store at 16 Central Arcade.

The plumbing shop of McCaffery & Sturrock has moved to 110 Stevens street, Spokane, Wash.

The Master Plumbers' Association of Pittsburgh, Pa., is arranging for a general meeting and banquet on March 15. The committee rooms and banquet hall of the Monongahela House have already been engaged.

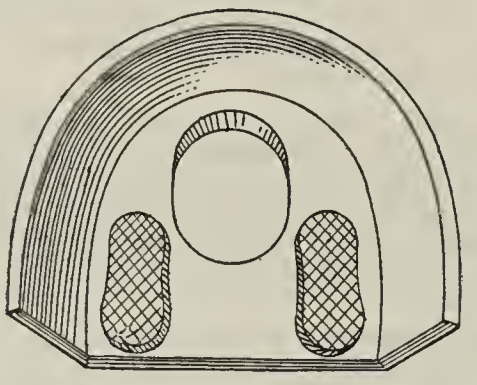
Robert T. Rock, Plumbing Inspector of Bridgeport, Conn., has resigned his position.

The Samuel I. Pope Company, contractors for steam and hot water heating, Fifth avenue and Jackson boulevard, Chicago, made an assignment February 25 to Albert M. Eddy. The assets and liabilities are given at $15,000. The company were one of the oldest in the city. Samuel I. Pope is president, and William A. Pope secretary and treasurer. Most of the company's work has been in large buildings. It is said the company will probably be reorganized.

Sanitary Fixtures in the Levant.

The primitive character of the sanitary appliances in the domain of the Sultan is related as follows by a correspondent of the London *Ironmonger:*

The sanitation of the Near East is at present in a very elementary condition, but a steady progress is made toward better things, and with it has come a growing demand for English water closets and iron flushing cisterns—articles in which British makers are easily ahead of all others. In the European quarters of the cities of the Levant English water closets are now generally used,



Sanitary Fixtures in the Levant.

but a certain drawback to their application is the frequent absence of any sewage or drainage system. Cairo, for example, has a population of 600,000, comprising a large proportion of Greeks, Italians and other Europeans. It has magnificent hotels, splendid palaces, electric tramways, modern gas plant and water works. Yet Cairo is as devoid of drainage as the neighboring desert. Many schemes have been propounded, and a few years ago an eminent British expert (Baldwin Latham) was invited by the Egyptian Government to investigate the Cairian drainage question on the spot. So far, however, nothing has been done beyond "studying the problem," though it is clear that it must ere long be taken in hand seriously. When that time comes there will be some good contracts for drain pipes, manhole covers and so on. But the day is not yet.

The closets most in use in Moslem countries—Egypt, Algeria, Tunis, Morocco, Turkey, and even in Greece—are of the kind known to some English makers as the *siège Turque*, and shown in the accompanying illustration. In a Moslem house the seat of the closet (if I may use that term, for it is not really used for sitting down upon) is raised only a few inches above the floor. The pan is placed in the center and let in so that its rim is about flush with the seat.

The pans in question are made of cast iron, enameled inside. They are of the usual hopper shape, but are fitted at the bottom with a self closing valve intended to prevent the foul air from escaping. An iron weight balances the valve back into its normal position after it has been forced down by the weight of the soil, thus always keeping the bottom of the pan closed when it is not in use. It is customary for the user to flush these pans with a pail of water at hand for the purpose.

All the pans of this kind used in the Mediterranean countries are made in France or Alsace-Lorraine. I believe that this is an article in which British iron founders could compete. As the law of the Koran is very explicit in its details concerning personal cleanliness, it is improbable that the *siège Turque* and its accompanying pan will ever be superseded by earthenware closets with wooden seats.

The town houses are built entirely on the flat system. They have no yards or gardens, so that all the closets are indoors. And, as a rule, by some strange perversity on the part of the builder the closet is placed as near to the kitchen as it can be put.

In Cairo and other undrained towns there is beneath every block of buildings a large cesspool into which the night soil finds its way through an iron pipe about 6¼ inches in diameter. Even where a sewage system does exist pipes of the same kind are used for connecting the closets with the sewer. The demand for them is therefore very large. They are made in Belgium, and are much lighter than Scotch pipes of the same description, weighing only 21 kg. per meter for a diameter of 16 cm., which equals a weight of 42 pounds 5½ ounces per yard of 6 5-16 inches in diameter. The makers' price is 126 francs per 1000 kg. (equal to 99 shillings per ton), delivered f.o.b. Mediterranean port. The business is worth having so far as the quantity turned out is concerned, and if the Scotch makers once secured it I fancy they would keep it, too, because in the heavier rain water pipes the Belgians cannot touch them.

Plumbers' brass foundry calls for little comment. So long as British water companies remain so exacting in their requirements as they are now the standard of such work turned out in Britain will be higher than is required in foreign parts, and all that needs be done to secure Egyptian business is for cock founders to turn out a specially light and cheap article for exportation only. The baths used in Mediterranean countries are generally made locally, but the few that are imported all come from Great Britain.

SCRAP.

In an article on the development of metal stamping prepared by Oberlin Smith for the *Engineering Magazine* there is a sentence containing incidental advice to Tin Plate makers. The writer refers to cuts illustrating well-known forms of can tops and bottoms "which certainly," he says, "are not unique," and any one of which a modern press run by a girl will produce from the sheet at the rate of from 10,000 to 20,000 a day. Were the Tin Plate of which they are composed made as it ought to be, and as inventive ingenuity will soon enable it to be, in long reeled up strips instead of small square sheets, these presses could be automatically fed and the articles produced at a much more rapid rate.

A Dutch journal gives a forecast of how long Tin mining will last in the islands of Banka and Billiton. During the last 16 years Banka yielded a yearly average of about 2500 tons of this metal. Borings show that this output may last over 30 years without any marked falling off. Billiton's Tin resources, with a yield of about 2000 tons yearly, will only last four years.

It is rumored that the New Castle Steel & Tin Plate Company, New Castle, Pa., will soon place contracts for ten more tin mills. This would give the concern the distinction of having the largest single Tin Plate plant in the world.

The two-mill plant of the Johnstown Tin Plate Company, at Johnstown, Pa., is making good progress toward completion. The buildings are about finished and the machinery is being rapidly put in place. It is expected that the works will be in operation early next month.

B. M. Decker has been appointed manager of the Irondale Steel & Iron Company's Tin Plate plant, at Middletown, Ind., in the place of Ambrose Beard, Jr., who recently accepted the position of superintendent of the Star Tin Plate Company's mills, at Pittsburgh.

The United States Iron & Tin Plate Mfg. Company, Demmler, Pa., makers of tin and terne plate, will make some important improvements and large additions to their plant. They will install five new hot mills, squaring shears and other additional equipment.

The employees of the National Tin Plate Company, Monessen, Pa., and of the Baltimore Iron, Steel & Tin Plate Company, Locust Point, Baltimore, have been organized into lodges of the Amalgamated Association.

G. W. Graves, Rochester, N. Y., stopped in New York this week returning from Boston, where he attended a meeting of the gas engineers. Mr. Graves says the prevailing opinion was in favor of lower prices for gas. This he expects will increase the use of gas for fuel and will have a beneficial effect on the sale of National Gas Stoves, made by the National Vapor Stove & Mfg. Company, for whom he is the Eastern representative.

THE RETAIL STORE.

INDIANA RETAIL HARDWARE DEALERS' ASSOCIATION.

The Indiana Retail Hardware Dealers' Association held their annual meeting last week at South Bend. The weather was unfavorable and probably for that reason the attendance was not up to the expectations of the officers. Nevertheless a good representation of the membership was on hand to learn what progress had been made during the year and to encourage the leaders in the work of organization.

The meetings were held in the gymnasium of the Commercial Athletic Association, which had been kindly placed at the disposal of the Hardwaremen and proved to be well suited for the purpose.

President George E. Nichol of Nichol, Makepeace & Co., Anderson, called the opening session to order at 2.30 p.m. on Wednesday afternoon. After some remarks on the objects and aims of the association and the evident benefits to be secured by the Indiana retail Hardware merchants through an organization of this character, he called for the report of the secretary, M. L. Lewis, of the Marion Hardware Company, Marion.

Mr. Lewis made a statement of the work done during the year, mainly in the direction of securing new members, and read a number of letters from Hardware dealers expressing their cordial sympathy with the movement.

Charles F. Bock of Battle Creek, Mich, president of the Michigan Hardware Association, being present, was called upon to address the convention and gave much interesting information relative to the work which had been accomplished by the organization in his State.

Among other things he alluded to the passage of an amended lien law, which had long been needed, but had not been secured until the Hardware merchants took up the question and pressed it to a successful conclusion.

After some discussion of methods of securing a larger membership the following committee was appointed to consider the various plans suggested and to formulate a practical scheme to be submitted to the convention at a later session : E. C. Minas of Hammond, M. L. Corey of Argus, J. C. Shanklin of Frankfort and Irving A. Sibley of South Bend.

At the evening session Mr. Sibley presented the special committee's report, recommending the appointment of a good canvasser to visit the retail Hardware dealers of the State for the purpose of inducing them to join the association, also setting forth a plan by which the canvasser would be remunerated for his services. The report of the committee was agreed to after some discussion.

The election of officers for the ensuing year was then held, which resulted in the following choice :

President, Geo. E. Nichol of Nichol, Makepeace & Co., Anderson.

Vice-president, Geo. W. North of Columbia City.

Secretary and treasurer, M. L. Lewis of the Marion Hardware Company, Marion.

Executive Committee: Irving A. Sibley of South Bend and Sharon E. Jones of the Jones Hardware Company, Richmond.

Two members of the Executive Committee hold over for another year—namely: J. C. Shanklin of Shanklin & Coulter Frankfort, and H. H. Taylor of Taylor Bros., Elwood.

The president, vice-president and secretary are also members of the Executive Committee. They were unanimously re elected.

The convention elected the following Investigating Committee to adjust complaints and grievances : O. E. Lang of O. E. Lang & Co., Mishawaka ; M. L. Corey of Corey & Stevens, Argus, and Charles B. Frame of D. Frame & Son, North Manchester.

After the election of officers, speeches were made by some of those who had been favored, and much enthusiasm was displayed in support of the objects of the association.

This was increased in a discussion introduced by Mr. North on the line of action to be taken relative to department stores and manufacturers selling to consumers. Messrs. Sibley, Corey, Lewis and others took strong ground against manufacturers selling to consumers precisely the same classes of goods on which they are soliciting trade from the retail Hardware merchant.

No radical action was taken relative to department stores, notwithstanding the annoying competition to which a number of the members stated they were being subjected.

Experiences of an interesting character were narrated relative to methods employed in meeting the irregular competition from various sources.

Mr. North told how he had turned to his own advantage a raid of Steel Range peddlers in his vicinity. Finding that they were traveling among the farmers, trying to sell Ranges at $65 or $70, he immediately sent out circulars and advertised in the local papers that he could sell equally good if not better Ranges for $36 to $40. The result was that, while the peddlers sold but one or two, he sold quite a good number of them to people who had their interest in Steel Ranges awakened by the discussion of the subject.

The next place of meeting will be Indianapolis, and probably some time in July, the exact date to be fixed by the Executive Committee.

Retail Stove Merchants' Protective Association.

Through the courtesy of Secretary M. Koch we present the following account of the last meeting of the Retail Stove Merchants' Protective Association of St. Louis, Mo., held February 23:

The present membership, which includes only legitimate one-line merchants, is 75, and there was a full attendance at the meeting. After disposing of the regular business it was decided to have an entertainment for the members at the next regular meeting, to be held March 9. All dealers in good standing who are not members are invited to attend. Music and literary entertainment will be provided, and good speakers will address the members on the benefits of association and the rights of dealers. Refreshments will also be served. The call and invitation are signed by the president, G. A. Pauly, and secretary, M. Koch.

North Dakota Retail Hardware Association.

Besides the proceedings reported in our last issue the North Dakota Retail Hardware Association at their meeting in Fargo on the 16th ult., passed a resolution to the effect that the secretary shall keep a record of any inquiries that may come to his notice of tinners, clerks, bookkeepers and the like who are looking for situations in Hardware stores, and that this information shall be given to any association members looking for such help. The following is the full list of officers elected for the ensuing year : President, Clark W. Kelley, Devil's Lake ; vice-president, C. F. Jacob, Hillsboro ; treasurer, H. N. Joy, Hamilton ; secretary, C. N. Barnes, Grand Forks. Executive Committee : W. R. McIntosh, Bottineau ; H. Harrington, Fargo ; H. B. Allen, Jamestown ; I. L. Newgard, Grafton ; H. L. Eastman, Wahpeton ; A. J. Smith, Fessenden ; W. H. Pinkerton, Lakota.

Combination Churn and Ice Cream Freezer.

The accompanying cuts relate to the duplex butter churn and worker and Klondike ice cream freezer, put on the market by the Duplex Mfg. Company, 221-223 East Second street, Cincinnati, Ohio. The machine is referred

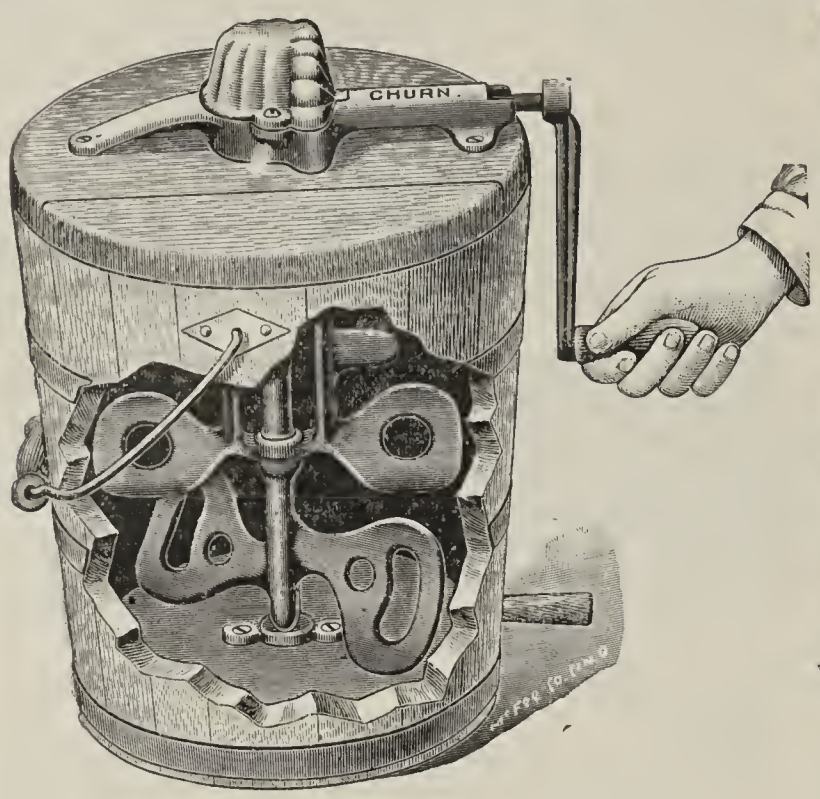


Fig. 1.—The Duplex Churn.

to as rapid, easy and perfect in operation and readily cleanable. The combination is furnished with an extra metal cylinder, which being substituted in a moment for the dasher of the churn transforms it into an ice cream freezer, thus combining a freezer with a churn in one machine. All material in their construction, it is remarked, is of the best. The dasher is made of malleable iron, the

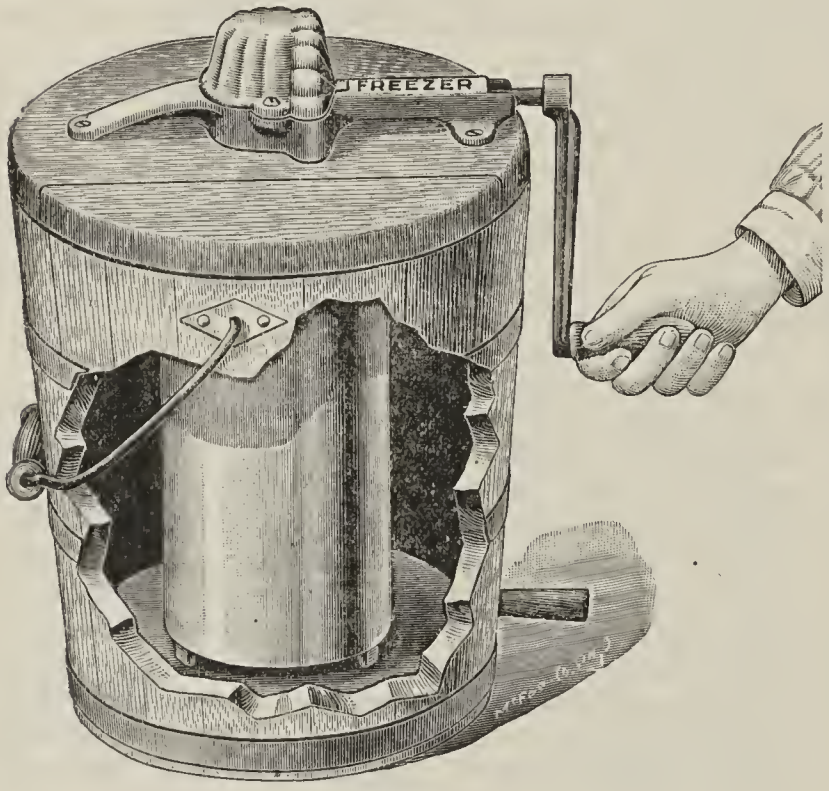


Fig. 2.—The Klondike Freezer

gearing and covers of cast iron, all thoroughly and heavily tinned and galvanized to entirely prevent rust or acids affecting the working parts of the machine. Among the advantages claimed for the apparatus is that it will produce more and sweeter butter from a given amount of cream than any similar device, because of the special design and construction of the dasher, which has a double motion. The manufacturers state that the machines will be made in the usual sizes.

The Leonard Water Cooler.

A new idea of the Grand Rapids Refrigerator Company, Grand Rapids, Mich., is the Leonard cabinet water cooler, which is herewith illustrated. It is constructed of solid ash, and is 49 inches high, 23 inches long and 17 inches deep. It is built like the Leonard refrigerator, being filled with mineral wool. The special features of this water cooler are well shown in the sectional cut. The water tank A holds 5 gallons and is porcelain lined, so that the water will be kept pure and clean for drinking. The pipe B is made of pure tin. It is coiled across the bottom of the ice chamber and submerged in the meltings of the ice C, so that water drawn through the pipe at the faucet above the tumbler is thoroughly cooled without contamination from the ice water. A pipe leads from the tumbler drainer into this compartment

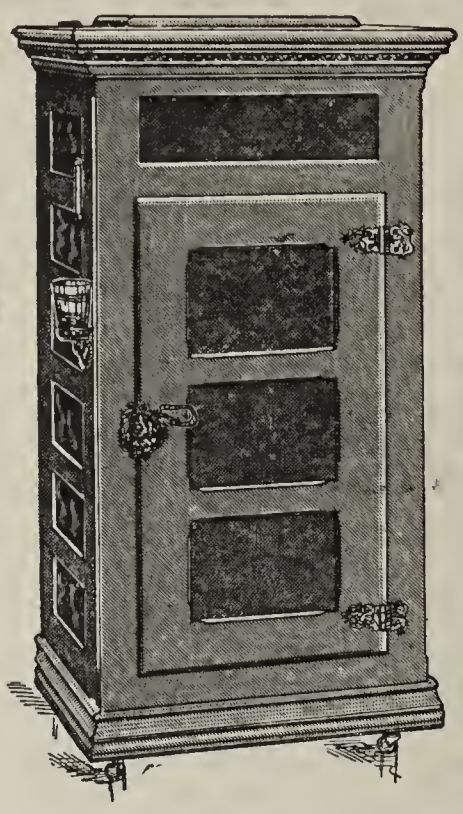


Fig. 1.—The Leonard Cabinet Water Cooler.

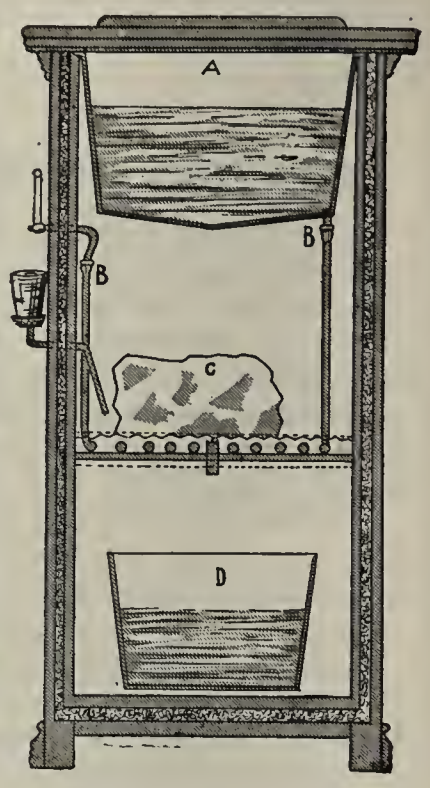
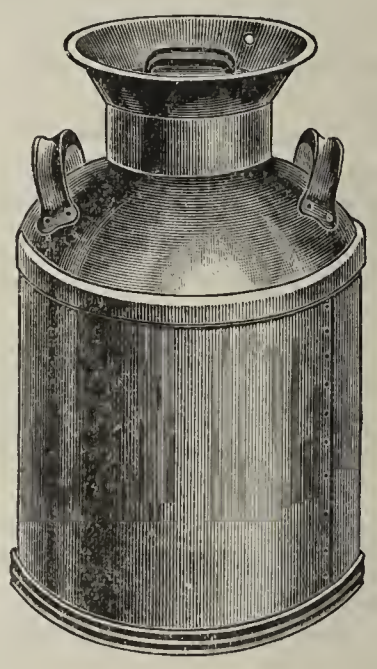


Fig. 2.—Sectional View of Cooler.

enabling the tumbler to be emptied without having an unsightly slop pail exposed. The ice compartment is a very convenient place in which to cool beverages in bottles. All the slops and melted ice water overflow into the pail D. No matter how dirty the ice may be, the drinking water will be pure and cold. The cooler has a lock and key.

The Milwaukee Railroad Milk Cans.

Kieckhefer Brothers Company, Milwaukee, Wis., are manufacturing a new line of milk cans named the Milwaukee railroad cans, of which the Iowa pattern is herewith illustrated as a sample to show the construction. The breast is double seamed to the body, the company claiming to have been the first manufacturers to adopt this method of manufacture. The neck and the bowl are stamped from one piece of metal, and the neck is then double seamed to the breast, which is also a new idea. These cans are retinned after they are completely made up, and the claim is also made that the company named are the only manufacturers of milk cans who do this.



The Iowa Pattern Railroad Milk Can.

Being retinned after manufacture, the cans are perfectly smooth on the inside, with no grooves or cracks for the dirt to accumulate. Three patterns are made—namely, Iowa, St. Louis and New York, with noiseless drop handles. The company make a heavier line of cans known as the Wisconsin railroad cans, equal to the heaviest on the market.

W. S. Crouch, dealer in Hardware, Stoves, Tinware, &c., Merrill, Iowa, has sold out his business to J. C. Button of Akron, Iowa.

THE OHIO HARDWARE ASSOCIATION.

Fourth Annual Meeting.

The fourth annual meeting of the Ohio Hardware Association was held at Columbus on Wednesday and Thursday of last week. At 2 o'clock on Wednesday afternoon J. P. Duffey of Greenville, president of the association, called the gathering to order. The president in his opening remarks stated that the association was to be congratulated that during the year 1897 they had lost no members by death, but that since the dawn of the new year they had to record the passing away of Messrs. Stone of Urbana and Gillum of Chillicothe. Appropriate resolutions had been offered and engrossed at the time by the Executive Committee.

The president noted the increase of membership for the year, referring to the fact that the association now contained the names of many of the best firms of the State.

Report of Secretary-Treasurer John F. Baker, was read, covering the minutes of the last year, the work accomplished and the results obtained in correction of grievances—a satisfatory adjustment or promise of adjustment being made in each case.

There being no salaried officials, the financial report showed no large depletion of the funds.

At the meeting of last year membership was increased from 43 to 65, with indications of a much larger roster before the close of this meeting.

For the good of the membership during the year the secretary wrote some 300 letters, giving some idea of the importance of the work at issue.

Members Present.

E. E. Barch, Elyria, Ohio.
Lion Hardware Company, Springfield, Ohio.
Huyett & Hill, Columbus, Ohio.
W. H. Angle, Piqua, Ohio.
C. B. Horner, Bellefontaine, Ohio.
H. Ronus, Dayton, Ohio.
C. E. Smith & Co., Malta, Ohio.
J. M. Martin, McComb, Ohio.
W. F. White, Shelby, Ohio.
Geo. Ash, Carey, Ohio.
E. G. Laughlin, Carey, Ohio.
Weibling & Patrick, Westerville, Ohio.
Wheaton & Cockrell, Sunbury, Ohio.
H. G. Woodward, Sidney, Ohio.
F. R. Ruhl, Bucyrus, Ohio.
E. Speasmaker, London, Ohio.
F. W. Ingalls, Bryan, Ohio.
M. V. Marquis, Bellefontaine, Ohio.
T. J. Morris, Lima, Ohio.
W. P. Scott, McConnellsville, Ohio.
L. F. Stahler, Waverly, Ohio.
H. A. Harger, Canal Dover, Ohio.
J. J. Ewing, Lima, Ohio.
G. V. Guyton, Ada, Ohio.
Jas. A. Bell, Roscoe, Ohio.
G. M. Gray, Coshocton, Ohio.
Adam Strome, Warsaw, Ohio.
F. H. Campbell, Bloomdale, Ohio.
J. M. Guiss, North Washington, Ohio.
Howard Killen, Plain City, Ohio.
Geo. Connette, Athens, Ohio.
John F.Baker, Dayton, Ohio.
J. P. Duffey, Greenville, Ohio.
O. M. Scott, Marysville, Ohio.
J. W. Brown, Washington, Ohio.
Frank Harrison, Toledo, Ohio.
J. M. Pierson, Greenville, Ohio.
B. M. Clark, Gettysburg, Ohio.
W. C. Bale, Westerville, Ohio.
A. L. Ennis.
C. C. Foutz, Middletown, Ohio.
E. L. Weuland, McComb, Ohio.
H. C. W. Seaman, Springfield, Ohio.
Frank Winter, Lancaster, Ohio.
E. W. Kalb, Bellefontaine, Ohio.
W. P. Bogardus, Mount Vernon, Ohio.
Doyle & Lee, Caledonia, Ohio.
A. Augsberger & Co., Kenton, Ohio.
Fred. Haberman, Marion, Ohio.
A. D. Hogendobler, Osborn, Ohio.
W. J. Conrad, Marysville, Ohio.
W. B. Tallmadge, Mount Gilead, Ohio.
W. A. Remy, Mansfield, Ohio.
H. A. Cosley, Troy, Ohio.
G. B. Hatfield, Troy, Ohio.
A. J. Ross, Bowling Green, Ohio.
M. A. Griffith, Madisonville, Ohio.
H. C. Mylander, Oak Harbor, Ohio.

After the president's address and the secretary-treasurer's report routine business was taken up. The manner of disposal of grievances, the letters in connection, the causes leading up to them, &c., were given in full to the members, followed by the reading of the resolutions of '94, covering the pledges made at that time and since, concerning the relations of manufacturer, jobber and consumer with the retailer.

Notice was given of the opening of a Question Box for the session of Thursday and a committee appointed for selection of questions and classification for discussion in the order of their value to the association.

Payment of dues for the coming year, by those now members and those expecting to become such, created great enthusiasm because of the numerous additions to the membership, some 20 new names being added at this session, others being expected before the close of the convention.

The subjects for the members appointed to read papers at this meeting were of their own selection and not those of the committee, as in other years. H. C. Wiseman of Springfield read the first paper, his subject being "The Progressive Hardware Merchant." Mr. Wiseman presented a comparison of the past and present of Hardware, with a hopeful and prophetic outlook for its future, suggesting methods and means of advancement, and soliciting interest among all for the betterment of the standard of men in the business, of employees, and the elevation of the plane of the business itself.

"Silent Salesmen," the subject of the next paper, which was read by Fred. Haberman of Marion, was an extremely unique and happy one. He brought out much in his subject that should be of great value to merchants, numbering among his silent help the cleanly and attractive showcase, the ever changing show window, the proper sampling of goods, the well swept and properly arranged store, the showy front, the well printed or engraved stationery—all these and more as salesmen—silent yet valuable—their service never ending.

Next a paper was read by W. A. Remy of W. A. Remy & Co., Mansfield, Ohio, on Does Advertising Pay the Retail Hardware Dealer?

Discussion followed on subjects suggested by various members, and subsequently committee reports, after which adjournment was had until time for the banquet, which was served in the ordinary of the Chittenden, to a large attendance of not only the members, but the Hardware friends of Columbus and a goodly number of traveling salesmen invited for the occasion.

The second day's meeting opened with an attendance of nearly 100, at 9.30 a.m The morning was largely taken up with what to all of the members was quite an innovation, being the Question Box, which on opening was found to be nearly filled with many inquiries of interest to the trade. These were placed before the members by the committee selected, in the order of their supposed value to those assembled. The discussions were very able and could well have occupied an entire day in convention.

In answer to one of the questions President Duffy had prepared a paper, entitled, Is the Department Store a Benefit or Injury to a City?

Toledo was the city selected for the next meeting.

The Committee on Officers for the ensuing year reported as follows:

President.
H. C. Wiseman, Springfield.
Vice-President.
J. F. Harris, Columbus.
Secretary-Treasurer.
J. F. Baker, Dayton.
Executive Committee.
O. M. Scott, Marysville.
W. A. Remy, Mansfield.
L. F. Stahler, Waverly.
F. Harrison, Toledo.
W. P. Scott, McConnellsville.
G. M. Gray, Coshocton.
C. C. Fontz, Middletown.

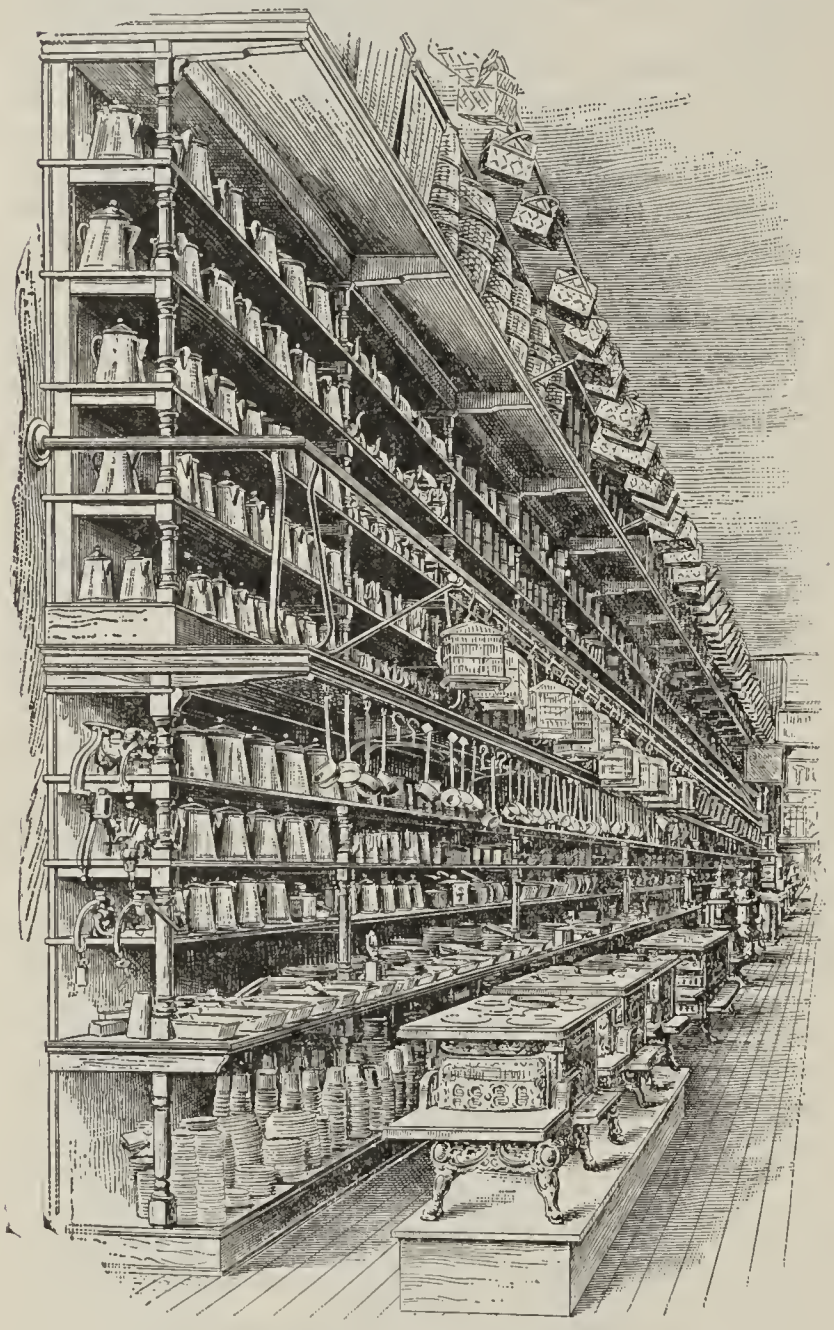
On motion the report of committee was adopted, making the official roster as above.

After short addresses by the retiring and incoming officials the convention adjourned.

In the evening a Bohemian smoker was tendered the association by the local wholesale and retail Hardware Association, and the entertainment proved to be a most enjoyable one.

Shelving and Balconies.

The accompanying cut represents the shelving and balconies in the Hardware store of A. C. Raymer of Omaha, Neb. The fixtures are alike on both sides of the room, the distinctive features of their arrangement being two balconies, one above the other, a wide base to shelving and no counters. The room is 25 x 110 feet in size, with a 22-foot ceiling. An additional feature of the balconies is the arms and rail extending at



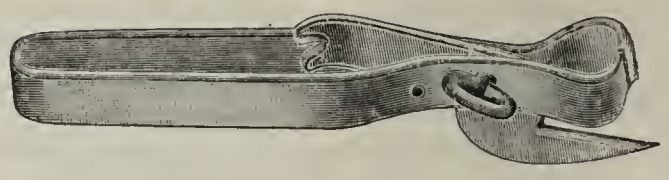
Shelving and Balconies.

an angle over their edges, upon which goods are displayed, such as Cages, Baskets, Lanterns, Coal Hods, &c. In the rear of the room is a steam elevator, which connects with each balcony, thus making the distribution of goods an easy matter. The shelving on the opposite side of the room is used for Shelf Hardware, while in front is a platform for Heating Stoves. Through the center of the room is a third platform, upon which are Steel Ranges and Heating Stoves. These platforms are used for displaying different lines of goods at various seasons of the year. Back of this room is the tin shop, 20 x 25 feet in size, above which is a sample room for Builders' Hardware.

The Keyser Mfg. Company, Chattanooga, Tenn., have published an attractive catalogue and price-list of the Odorless Refrigerators of their manufacture. The general constructive features of this refrigerator are briefly but clearly explained in the earlier pages of the pamphlet, broken views and sectional illustrations making the explanatory notes very clear. The latter portion of the publication is given up to half-tone engravings showing the various styles and finishes of the Odorless Rrefrigerators, which vary from small simple constructions to elaborate Refrigerators for restaurants, grocers, butchers, &c. The catalogue also contains an illustration of a solid red cedar Moth Proof Closet which this concern make. A small pocket edition of the catalogue, giving the same general information, is likewise issued by the Keyser Mfg. Company.

The Klondike Combination Can Opener.

The combined can opener and tack puller here shown is put on the market by the F. J. Hall Company, Wallingford, Conn. The blade is of crucible steel, tempered and sharpened. The handle is Bessemer steel, plated and nicely finished. By loosening the set screw the blade can be revolved, bringing either tool into position. The shape of the end of the tool nearest the set screw is re-

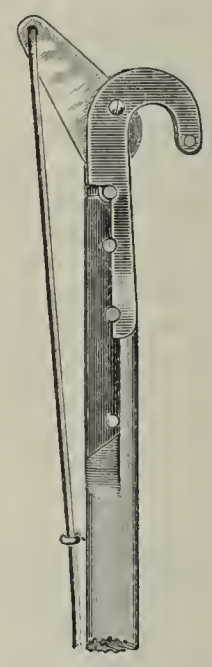


The Klondike Combination Can Opener.

ferred to as being such as to make a large fulcrum for the tack puller, so that the tack is raised out straight before the hand strikes the floor. The point is made that two tools are thus retailed at the price of one. The goods are designed to sell for 10 cents, and are put up in a novel and attractive manner, one dozen in a case.

The New Standard Tree Pruner.

Seymour Smith & Son, Oakville, Conn., are offering an improvement in their tree pruners, as shown herewith. The illustration shows the pole and iron cut away to expose to view the metallic brace plate. This consists of a



The New Standard Tree Pruner.

strip of steel 6 inches long, inserted in a slot in the center of the pole, a recess being cut in the steel to fit the washer in the head. The steel and head are securely fastened by rivets passing through all to strengthen the pole at the point of the greatest strain, reinforcing the wood in such a manner as to prevent its breaking or splitting.

Effective Window Displays.

Landers, Frary & Clark, 82 Chambers street, New York, had an effective front window display, the results of which serve to emphasize the value of concentrating attention on a single leading article. One of their glass Cutlery display cases was taken and neatly trimmed and the interior arranged stair fashion. Along the upper tier was clamped a row of nine of their new Universal Food Choppers, all alike. Directly in front of each Chopper on a lower step was a white enameled 8-inch plate with a number of food articles of different degrees of fineness, varying with the purpose for which they were to be used, showing the universal character of the Meat Chopper and some of the possibilities of its three different cutters. On one plate with a neatly stenciled card was "Cheese for Welsh rarebit, macaroni, &c.," the next "Raw meat for Hamburg steak, beef loaf &c.," followed by "Boiled potatoes for hash, salad, &c.," "Cooked meat for hash, mince meat, &c.," "Cocoanut for cake, pudding, pies, &c.," "Vegetables for soup," "Chocolate for pudding and cake," "Powdered cracker

for pudding, cake, &c.," "Citron for cake and pie," and an extra plate containing horseradish. Hanging on the window just above was a neat sign with the caption "Universal Food Chopper. Chops food of all kinds, either raw or cooked, quickly, perfectly and without waste. Come in and see it work." It is needless to say the idea took and attracted passers by from morning to night.

New Columbus Settee.

The Columbus Wire & Iron Works, Columbus, Ohio, ave added the settee here shown to their line of this kind of metal goods. In common with other styles of settees made by the firm, the new pattern has wrought iron frame and steel wire seat and back. It is remarked that there is an entire absence of cast iron parts which might break, also of wood which is liable to absorb dampness. The wire seats and backs have, it is stated, sufficient flexibility to insure comfort, while there are no large surfaces to absorb heat or cold. The settees can be shipped in a knock down condition in a crate 4 inches in thickness, thus securing to buyers a low freight rate. The construction, it is explained, is so simple that any one can set up the settees without special directions. The particular advantage,



New Columbus Settee.

aside from the knock down feature, is said to be the low price at which the settees are offered. They are designed for lawn and cemetery use.

MEMORANDA.

The Hill-Whitney & Wood Company, 90 Canal street, Boston, Mass., were recently incorporated under the laws of Massachusetts, with a capital stock of $55,000. They succeed the Hill-Whitney Aluminum Company, well known as manufacturers of a large variety of Kitchen Utensils made of special hard aluminum. They advise us that new machinery is being put in and many other improvements being made at their factory.

Benjamin W. Felton, for many years identified with the Stove and Furnace trade of Eastern Massachusetts, died at his home in Roxbury, Mass., on Friday, February 25, at the age of 64 years. He was a native of Fairfax, Vt., and went to Boston when a young man, settling in the Roxbury district. Starting in a small way on Washington street, he succeeded in building up a large business, being the head of the Felton & Turner Furnace Company of 2 Warren street, and was widely known among dealers, architects and real estate men.

The National Patent Company, Johnstone, Scotland, who are large makers of patent mouse traps in Britain, are turning their attention to America, and we understand they are on the lookout for an agent for this country. They are the makers of the Detective, the Snap Shot and the New Snap Shot mouse traps. As indicating the extent of this industry, it is stated that their output last year was at least 150 tons. About 50 hands are employed in this department.

D. H. Evans has lately embarked in business at New Whatcom, Wash. Mr. Evans is retailing Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, &c.

A. E. Marsh has succeeded to the Hardware business of S. R. Gray, in Lime Springs, Iowa. Mr. Marsh is handilng a general line of Shelf and Heavy Hardware, Stoves, Tinware, Implements, Sporting Goods, &c.

Rodney & Monk, formerly of Woodburn, Iowa, have lately removed to Humeston, where they will continue the retail business in Hardware, Stoves, Sporting Goods, &c. They are located in a brick building, 24 x 100 feet in dimensions. The store has been equipped with new shelving, wall cases, &c.

Jennings & Harris have succeeded to the Hardware business of the Harris Furniture, Hardware & Grocery Company, Water Valley, Miss. The new firm advise us that they are handling only Shelf Hardware and Tinware at present, but expect to take up Stoves in the fall. They refer to trade as good.

The Lion Hardware Company, Springfield, Ohio, have recently been making important changes in their establishment. Their Mantel stock has been removed from the first floor and is now to be found on the floor above. The space formerly occupied by Mantels will be utilized for the accommodation of Harness and Carriage and Wagon Hardware, lines which have not heretofore been carried. The company state that business is rapidly improving and the prospect for the future is very gratifying.

C. W. Young, Juneau, Alaska, wholesale and retail dealer in Heavy and Shelf Hardware, Tinware, Sporting Goods, Lumber, &c., Klondike outfits being, of course, a specialty, has enlarged his store until its present dimensions are 30 x 110 feet. A second story is also being built, which will be devoted to a stock of Furniture. Mr. Young has installed new shelving, counters, fixtures, office, &c., thus adding to the attractiveness of the interior. The exterior is being embellished by a plate glass front.

Sandless Pig Iron.*

BY E. A. UEHLING.

There now exists a successful casting machine which does all that can be desired, and its advantages to the producer of pig iron are such that no blast furnace can afford to be without it.

In proof of this it will suffice to say that the casting machine at the Lucy furnaces, which has been in operation since April 3, 1897, had up to January 1 handled 163,497 tons of iron, 18,000 of which was spiegel. During all that time it did not miss a single ton of the output of the two furnaces. It was and is always ready to take the iron when it is brought to it. The machine at the Duquesne furnaces had demonstrated its capacity to take care of 1200 tons of iron in 24 hours with ease. The cost of handling the iron at the Lucy furnaces, including all repairs to the machine, ladles and refractory material, was 10.6 cents less per ton than that of handling it the old way, thus effecting a saving in labor cost of $17,330.68 in nine months, or $21,663.55 in a year.

The scrap made is less than 25 per cent. of that made by the old way. Contingencies like those faintly pictured above cannot occur. The ladles are returned to the furnace as soon as emptied, and the furnace can be tapped whenever desired. There are no boils, no jump cores, no sheeted beds, there is neither scruff nor cinder on the iron. The pigs are uniform, smooth and clean. The labor required about the machine is so easy that it looks like child's play compared with the other work about the blast furnace. Not a pig of iron is touched by hand from the time it leaves the furnace until it reaches its destination or is piled on the stock yard. These are, in brief, a few of the advantages that will accrue to the producers of sandless (machine made) pig iron in which the consumer does not share. The advantages of sandless iron over sand pig in which producer and consumer share alike may be summed up as follows:

1. The abomination called the sand ton will be done away with. A ton of pig iron will be 2240 pounds, and if it weighs that at the furnace it will weigh the same at the foundry. With it nine-tenths of the wrangling over short weights will disappear.

2. Grading by fracture will no longer be the basis of quality and price, and this will remove the most prolific bone of contention between producer and consumer of pig iron. The fracture of pig iron is a delusion and a snare. There is not one man in ten, whether consumer or producer, who can tell by the fracture a pig of iron suited for car wheels from one fit for stove plates.

At the furnace all foundry iron is graded by fracture. The pigs are broken in the middle and piled according to grade. As a rule, this is done as carefully as possible; but where is the line of demarcation between succeeding grades? What is the difference between an open No. 3 and a close No. 2, for example? No matter how carefully the grading is done, there must be, by the very nature of things, in every grade, some pigs closer than others. There is therefore always room for contention, even when both sides are trying to be fair, which is not always the case.

*Part of paper read before the Pittsburgh Foundrymen's Association

The following episode has come within the writer's experience: A lot of No. 2 iron was shipped to a consumer. Before the cargo arrived at destination the price had declined 50 cents per ton. When the date of settlement came, instead of the proper remittance, there came a long letter of complaint, stating that the iron was not up to grade, that fully 50 per cent. of it would not go better than No. 3, and that a reduction in price must be made on the iron equal to the difference in the market value between the grade sold and that actually shipped—viz., 50 cents a ton. The case was worth investigating. When the furnace representative arrived, he found a lot of samples of the iron in the office awaiting his inspection. The iron was from the lot, there was no doubt of that, and the grade was not better than an open No. 3. He knew that straight No. 2 had been shipped, so closer investigation was necessary. He went to the pig iron yard. The attendant furnished by the customer broke a lot more of the half pigs, with the same result—an open No. 3 at best. But the furnace representative happened to be equal to the occasion. He helped himself to some of the iron and broke it, and to the pretended great surprise of the purchaser nearly every pig showed a fracture much nearer No. 1 than No. 2, and the iron was accepted as sold. The fact is that nearly every pig of iron varies in grade from one end to the other. Not infrequently you can show up three distinct grades in one and the same pig. The sow, if at all heavy, is invariably from half to a whole grade higher than its pigs. Is the iron in the sow therefore of a better quality? This is hardly reasonable, yet you pay from 50 to 75 cents more for it.

The value of an iron does not depend upon its fracture, nor is the fracture any guide as to the special purpose for which a certain iron may be best suited. It is an indication of the condition of the furnace that produced it, and not an altogether reliable indication of that even. The principal factor that determines the grain in the fracture of cast iron is the time given it to pass from the liquid to the solid state. No one is better aware of this fact than the foundryman. Of two castings poured from the same ladle, the lighter casting is invariably the closest grained. The degree of hardness resulting in a casting is not determined by the fracture of the pig; but entirely by its chemical composition and the rate of cooling. No. 1 iron may be fitted for car wheels, or it may be suited for stove plate, or it may be useless for either. How many can tell what it is suited for by the fracture? No. 1 iron may contain anywhere from 0.5 to 3.5 per cent. of silicon, and the other elements with the exception of carbon may vary in the same proportion.

Experience has taught the practical foundryman that certain brands of iron are best suited for a certain class of work. He ascertains this by trying first one and then the other, and then several brands in combination in varying proportions, until he gets the right thing. When he has it, he sticks to it. Everything goes smoothly for a while; but suddenly something gets wrong. The castings come out hard or lack strength, too much shrinkage, full of blowholes, cold shots and what not. What is the trouble? The same brands, the same grades, the same mixture. No change at all, yet there must be something the matter with the pig iron, and it must be in that last shipment, of course. There was no trouble until it was put on.

It is thoroughly investigated, and sure enough the lot contains pigs with close edges, others with dense spots, and more with irregular grain. The iron is not up to grade anyhow, and the whole shipment is condemned. If the price of iron tends downward the producer is in for all or at least part of the damage. With a stationary market it is a toss up, and on a rising market the consumer pockets his loss. In reality the chances are at least even that the trouble was not from the iron at all. There are as many chances as there are brands of iron in the mixture that the wrong brand was condemned. Nine times out of ten it will be used up later on and give the best results. Making up mixtures for special purposes, depending solely upon the fracture to guide you, operates on the same principle on which the Irishman got the weight of his hog. He selected a log with great care, balanced a plank very nicely across the log, laid the hog on one end of the plank and piled stones on the other end until it was accurately counterbalanced, and then he guessed at the weight of the stones.

The condition of the sand in the pig beds, the rapidity with which the iron fills the beds, the size of the pigs, are all factors that greatly influence the fracture. If two pigs lying side by side in the same bed happen to be of unequal size, the larger will invariably be of a higher grade than the smaller. If the large pig is No. 1 the small one may not show better than No. 3. Has the quality suffered because the mold was not run full? Yet this pig, with many others whose fracture suffered from similar causes, goes to the No. 3 pile, and brings 75 cents less per ton.

The reverse also holds good. By proper coaxing a No. 3 can be elevated to a No. 1, and in order to please the consumer who buys on fracture the producer does all the coaxing he can, by making the pigs large, covering them up with sand, providing a third casting bed, &c., to give all the time possible for the iron to cool. Except in very wide limits the fracture of pig iron is simply something to guess the quality by. It is the pile of stones that counterbalances the Irishman's hog—it is something to quarrel about, and the sooner grading by fracture is abandoned the better for all concerned.

Chemical composition is the only true guide by which iron can be intelligently judged as to its quality and fitness for the purpose in hand. Chemistry in the foundry is still in its infancy, and much is yet to be learned. But with foundrymen's associations established all over the country, composed of intelligent and energetic workers in behalf of the practical application of scientific principles, the advantages of chemical analysis as well as synthesis are beginning to be more generally understood and appreciated, and it is only a matter of time when its benefits will be fully realized. The greatest drawback to the practical application of chemistry in the foundry is due to the fact that with iron cast in the sand in the ordinary way it is almost impossible to get shipments of uniform composition. This is due to the fact that the iron as it flows from the furnace is very irregular, and it not infrequently happens that there is a difference of 1.5 per cent. in the silicon from the first to the last bed in a cast of iron of practically the same grade.

The last, but not least, mutual benefit that will be derived from the use of the machine for casting sandless foundry iron will be due to the fact that it will not only be possible but very easy to furnish iron of uniform composition. The iron of each ladle containing 15 to 20 tons will of necessity be uniform, and can be easily analyzed and piled or shipped according to analysis.

We now come to the advantages that sandless pig iron will have for the consumer alone: 1. I am authorized to say that in the basic open hearth furnaces at Homestead where all the iron produced by the Lucy furnaces has been consumed, sandless pig iron has been demonstrated to be worth at least 50 cents a ton more than sand iron of the same composition. This enhanced value is due first to the fact that it melts more readily than iron with a crust of sand about it, and is in a more advanced state of reduction when melted Hence it is more quickly converted. 2. The sand damages the hearth, and requires additional flux. The sandless pig is harmless, and the flux required is a minimum, thus saving material as well as wear and tear. 3. In consequence less fuel is required to convert the sandless pig into steel. 4. This results in an increased output.

The same holds true in remelting in the cupola for Bessemer steel. The sandless pig requires less flux, less fuel, melts more quickly, and results in appreciably less wear and tear in the cupola. No systematic tests have as yet been carried out, but the advantage of the sandless pig iron is easily estimated at 10 cents per ton.

From this I feel warranted to draw the inference that a similar saving, though possibly, owing to the intermittent work, less in degree, should result with sandless iron in the foundry cupola.

The results obtained by Thos. D. West, which were presented at your last meeting, indicate clearly that there is less oxidation from clean iron than from iron cast in the sand, otherwise of identical composition. The average of Mr. West's experiments showed the loss by oxidation in remelting sand iron to be 5.5 per cent., while the loss in sandless iron was only 3.4 per cent. Taking pig iron at $10 a ton the loss on the sand iron would be 55 cents, against 34 cents on sandless pig—a clear gain in favor of the machine iron of 21 cents per ton. These results will require corroboration on a larger scale before they can be taken as absolute, but they indicate what may be expected.

The sandless iron melts quicker and with less fuel than the sand pig. It is less liable to be contaminated by the impurities in the fuel. It will require less flux, and will make a cleaner casting. In short, the indications are that it will prove in every way superior to the sand pig for foundry use.

The State Department has authorized the United States Consul, at Tampico, Mexico, to assist American manufacturers who may be desirous of exhibiting their goods in that place. It is announced that a room at the Consulate will be devoted to the exhibition of samples of soap, grain foods, cutlery, writing paper or any small articles that may be easily handled. It will be necessary for merchants or manufacturers desirous of taking advantage of the opportunity to prepay charges on freight and delivery.

The New York Railroad Commission are entering on an active movement to do away with the 9000 grade crossings in the State. They propose to divide the expense of their abolition, 50 per cent. to be borne by the railroads and 25 per cent. each by the State and municipality. The Finance Committee of the Senate have favorably reported a bill appropriating $400,000 for beginning the work.

STOVE TRADE NOTES.

SHORTS —II.

BY THOS. F. KENNEDY.

FOLLOW BOARDING.

Follow boarding is one of the details of stove making which does not receive the attention its importance deserves. When stoves were first made by the piece the price was put on the whole stove, and a molder or gang of molders had to make every piece before getting credit for a stove. Hence the molder made as great an effort to get the smallest as the largest piece. No doubt there often was complaint about the way the boarding was done, but as the loss of evening up fell on the molders it is not likely it produced much effect. As the number of stoves to be made from one set of patterns in a single day or at a single heat increased a stove had to be divided among an increasing number of molders, until a point was reached where the gang got too large and the result was not satisfactory to either the molder or the manager. The prevailing system was then gradually adopted, and as the loss of evening up fell on the owners of the foundries better boarding plans were slowly evolved.

Greater care was taken in placing deadheads, and where several pieces of different kinds were made on one board an effort was made to keep those on the same board that would work best together. This is the full measure of the progress made in follow boarding in the majority of foundries up to the present time. The fact is the method in vogue is not susceptible of any further improvement. A radical change in method must precede any successful attempt to improve boarding and flasking practice. The change I have in mind would be most sweeping, but its advantages have long been partially recognized in all stove foundries. In a few where it has been more fully developed the practice differs widely. If the rule one pattern or one kind of pattern on each board was adopted it would reduce the number of shorts and greatly lessen the cost of dealing with the remainder.

Before I ever saw a stove foundry it was the regular practice to make four or more covers and four or more legs on one board, until now in the foundries of large concerns the principle of one kind of pattern on each board has been extended to many other pieces. In those works where a large number of stoves are made off a set of patterns and where first cost is not a potent factor in deciding for or against a method this may be all right, but for small concerns the making of two or more patterns for all small pieces, with the work incidental thereto, would be a serious matter. However, this multiplication of patterns which from their size or nature cannot be made in a snap flask and are too small to make one on a board on the floor is entirely unnecessary. It is done for the same reason that several pieces of different kinds are made on one board—that is, because floor molders would rather make three pieces in one flask for 12 cents than the same three pieces one in a flask at 5 cents each. This is a very substantial reason if those pieces must be made on the floor. But must they? Let us see.

Can any one name a single body of workers in any field of human activity who stoop to do work, when it can be avoided, except molders? I could fill this page with a list of trades and arts where there is better reason for stooping to do the work than there is in molding small stove work, and yet means have been found to avoid it. How many molders does the reader know who are suffering from lame backs brought on by stooping?

It is a fact that all floor molders will testify to that small work, no matter how arranged, is much harder on the back than large work. It is a common thing to hear a molder say, "I don't mind the large work, but the small work is killing." And there are plenty of molders who can do a good day's work on large work who could not stand to make small pieces on the floor, though the large work requires far more exertion than the other. A molder making small pieces on the floor must maintain a stooping posture of varying degrees all the time while molding, excepting the short time while ramming, and all don't straighten up then. The molding time varies from six and one-half to eight hours. A man of average hight must work more than one-half of this time bent over at an angle of 90 degrees, and I have seen men making work which required great care in finishing who had weak sight, or, having strong sight in poor light, bent over at an angle of 50 or 60 degrees doing the most particular part of their work. Did the reader ever notice the small percentage of old and elderly men engaged in stove molding, smaller than in any other occupation of which I have any knowledge? There are plenty of molders shortening their lives working on small stove work on the floor who have recurrent attacks of lame back and sore chest. These often become chronic and they are obliged to give up. A very large percentage of these defects would never develop sufficiently to cause inconvenience under normal conditions where a man could stand up straight, or nearly so, all the time.

No wonder statistics collected a few years ago showed that the average length of time spent at the trade by those learning it was 15 years. The first impulse of a young man or boy when he starts to learn the molding trade is to avoid stooping by kneeling down, but the foreman or instructor will quickly tell him that he will never make a molder if he kneels down to any of his work. Jobbing and machinery molders do kneel sometimes, but I know of but one stove foundry where it is a common practice, and there the follow boards are very poor. It is related of the workers in an industry where the large quantities of dust and fumes were a constant menace to health that when a device was invented which promised to nullify their evil effects its use was secretly opposed by the workers on the ground that its introduction and successful use would surely cause a reduction in wages. No doubt this consideration would produce and nourish a hostile sentiment which would cause plenty of floor molders to stand in their own light and deter them, if they were allowed to choose, from taking advantage of an improvement even though it promised to lessen their ills and lengthen their days.

In following out the rule laid down for follow boarding I would eliminate wherever practicable the portion that says one kind of pattern and make it simply one pattern on each board. Any piece which from its size and nature cannot be made in a snap flask, and is too small to be made one in a flask on the floor, will, in 19 out of every 20 cases, make a good job if made alone on a board in a suitable flask on a properly designed movable bench. It is to be anticipated that objections would be made to any such radical departure from long settled practice. Most of the objections are obvious to the experienced stove man. The molders would no doubt, for reasons already touched upon, offer numerous trivial objections. The only one I can think of worthy serious consideration is the raising of the sand an additional 15 or 20 inches and the lifting of the finished mold from bench to floor.

I claim that being enabled to stand erect 99 per cent. of the time trebly compensates for the extra exertion involved in raising the sand and lifting the mold. When he stands erect the molder can perform the parts of his

work requiring delicacy of touch with such precision, accuracy and swiftness as would be impossible on the floor, and the more intricate and complicated the work the greater the advantage. Then, with the class of work that could be made thus he would have but one pattern to deal with instead of two, three or more as on the floor. The difficulty of coping a mold increases in an increasing ratio with the number of difficult points in the mold. For instance, a piece with one bad point on it might be made one in a mold without any trouble, but if we put several such pieces in one mold it may be almost impossible to get a clean lift.

So much for the molders. The manager would object to the increased number of flasks, but in return for the slightly increased first outlay for flasks his small flasks would remain good as new much longer than large ones. I have seen small wooden flasks which after regular but not continuous use for 30 years are still serviceable. Small flasks like snap flasks can be used for a great number of different jobs, and where many different stoves are made this would be an advantage. Every one with any foundry experience knows how much easier it is to "pick up" a flask for a small board than for a large one. When the stove for which a small flask or flasks were provided is no longer made they can be used on another stove often without any alterations.

The small flask made on the bench would, by abolishing mixed boards, remove one cause of shorts and at the same time make it easy to deal with such as could not be avoided. It would often make it possible to reduce the number of patterns required. Where three or four would have to be made, with all the work it entailed, one or two would do for the small flasks. The small flask made on the bench would enable molders who now earn a precarious living at some chance employment to work at their trade, and many of whom are good mechanics, but owing to some weak spot in their make up cannot stand floor molding.

The Chicago Stove Trade.

Some improvement is noted in the Chicago stove trade. A better demand is experienced for cooking stoves and ranges. As compared with the opening months of last year the volume of business for January and February of this year showed a very comfortable gain. Business is now nearer its normal condition than during the dark days of depression in the latter part of 1896 and the beginning of 1897. Better goods are again in demand, showing that people are blessed with greater purchasing power. The spring trade in coal stoves and ranges, however, is not up to what it was in the palmy days of the past, and much doubt is expressed as to whether they will ever return. Business in this line is being more and more concentrated in the fall months, when two or three days will show as large a trade as a whole month in the spring. Nevertheless, a scattering trade develops in the spring which is worth looking after and which manufacturers must continue to cultivate. It would be the hight of unwisdom to discontinue efforts to sell during this season, as those who do so would be out of touch with the trade.

Rathbone, Sard & Co.,

Wabash avenue and Randolph street, Chicago, are displaying samples of new coal cook stoves which have been brought out to meet the demand for moderate priced goods. The Brilliant line represents the fourth grade of cooking stoves made by this company and sells at a correspondingly low price. If such a stove had been offered to the trade four or five years since it would have been classed as a medium grade. It is very attractive in appearance and is well constructed, easily excelling the general run of stoves of its class. The oven is square, which is a feature usually found only in higher priced stoves. The fire pot is oval and has a single or double back as desired. These stoves are furnished with a large front feed or the usual pouch feed, so that buyers can take their choice. Five sizes are made, so that the line is very complete, comprising so many sizes and styles. It is offered by the manufacturers as a desirable line to accompany their higher grade Electric Acorn line. The molding is of the modern style of raised carving, decidedly striking. The same line is furnished with a less elaborate finish, and therefore at a still lower price, under the name of Ruby cooks. The castings are precisely the same, but the exterior is plainer.

Changes in Foundry Mixtures.*

BY EUGENE W. SMITH.

In the discussion before the Western Foundrymen's Association in February, 1897, on "What Is the Proper Amount of Air and Pressure of Same to Melt Iron in the Cupola, and What Are the Effects of Too Little or Too Much Air?" the third division of the question was quite thoroughly discussed. The general opinion was that the changes in iron are probably due to mechanical changes. Mr. Dalton attributed hard iron in the first part of the heat to the condition of the cupola. Mr. Pettigrew claimed that the first iron is softer, providing the cupola is dry. If the conditions are constant, why should not the results be the same? Mr. Coffeen supported the theory of open cupola and excessive blast pressure by his statement that he found it necessary to use softeners in the first part of the heat. Mr. Ferguson advocated using all the blast pressure obtainable, but stated that iron is harder at the beginning of the heat. If the mixture is the same should not the result be attributed to a mechanical condition existing in connection with the cupola? The deductions obtained at that time by Mr. Carter served to show that the figures given were pretty close as to amount of air required—viz., Mr. Sorge, 2500 pounds; Mr. Thompson, 3000 pounds; Mr. Hanna, 3000 pounds of air per ton melted. Thus we see that the members who were prepared to discuss the amount of air required came very near agreeing. The members who discussed the effect of blast practically agreed that there was a difference in the first iron melted, but did not go far enough and find the cause, which the writer thinks might be attributed to some mechanical change, as expressed in this paper.

Mechanical changes which occur in cupola practice often serve to confuse the foundryman who is otherwise very careful as to the charges which he gives to his melter. Every now and then some one gives a theory to explain why the first iron is harder than the last, and another will give a reason why it is softer. Each demonstrates the matter to his own satisfaction in scientific terms, citing the destruction of silicon, combining of carbon, effect of sulphur, &c., but all this only serves to mystify the ordinary foundryman. All conditions being equal, results should be the same, no matter at what period of the heat the charge is melted, the differences being due simply to some mechanical change due to handling. Some of these changes the writer will try to describe in the present paper, showing the absolute care which must be taken in handling to obtain uniform results.

1. A very common source of error occurs in the charging room in weighing up the charges. Sometimes a certain brand of iron is not broken as small as others and the charger is not careful as to balancing his scales, causing variations at different times during the heat.

2. The placing of iron in the cupola in such a manner as to cause uneven melting, allowing one brand to melt and mix ahead of others, frequently causes trouble.

3. Improper drying of the cupola is probably one of the most frequent causes of hard iron in the beginning of the heat, particularly so if the receiving ladle, hand ladles, &c., are not thoroughly dry, or even cold, causing changes in the condition of iron by chilling.

4. Probably the most important cause of change in the first iron melted is the excessive use of blast. The cupola at that time is probably in its very best condition. The fuel resembles an open network, somewhat like a sponge, unobstructed by slag, which does not begin to form until considerable iron has been melted. The tuyeres also remain unsealed, and if conditions are otherwise all right the iron will be exposed to the oxidizing effect of the blast while trickling through the fuel, serving to harden it. This is generally attributed to a chemical change caused by sulphur in the bed charge of fuel. But there is no good reason why the suphur should predominate any more in the first charge than later in the heat, or, as is sometimes the case, on one day more than the next, when the same fuel is used. It is also attributed to the destruction of silicon, which is probably the true effect, but not the cause. It is simply a condition which should not exist, as the heat required is no greater at that time than later on. True, it is hard to draw the line by calling it a mechanical change when the carbon has been combined, no matter by what cause. Still, it may be avoided mechanically, where control of the blast may be had, by reducing the pressure to the lowest point possible without delaying the melting process. This trouble is met with in all foundries more or less, except where large amounts of iron are carried in the cupola. In such cases the effect of blast would not likely be apparent.

* A paper read before the Western Foundrymen's Association.

5. Another source of error, caused mechanically, occurs where the iron is drawn off faster than it is melting, not allowing it to mix properly, thus obtaining hard iron at one time and soft at another.

6. A change in condition occurs where the slag hole is used and the cupola is held too full, allowing the slag to clear off the iron, thus exposing it to the oxidizing effect of the blast.

7. Still another change is caused where the lining of the cupola has been made too hot in drying out, which sets fire to the fuel charges above the melting zone at one side or the other, causing the stock to come down unevenly.

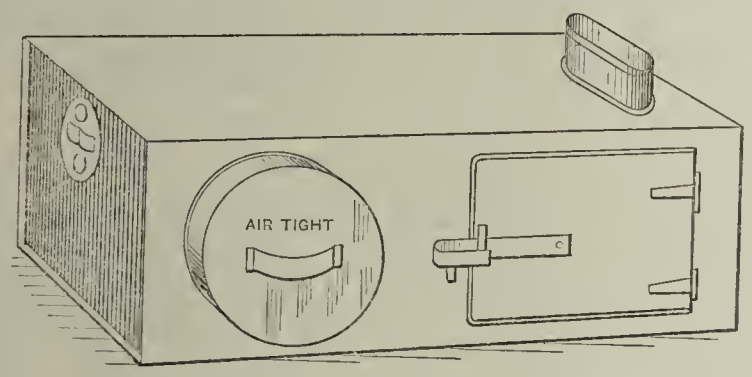
8. Very often the tuyeres are formed unevenly, with larger openings on one side than the other, causing the stock to melt faster on one side, thus giving an uneven result.

9. Another instance occurs where economy in the use of fuel is practiced. The bed may be all right and heat started successfully, but by the excessive use of blast the bed of fuel is gradually decreased, until at last, when charging is all done and the doors closed, the iron melts too close to the tuyeres, which is almost invariably a cause of hard iron. Soft fuel under the same conditions would likely have the same result. In the above case an excess of thin fluid slag, about the consistency of soapsuds, will be noticed, very foamy and light; and if the blast is excessive the slag will be held up by its pressure around the sides of the cupola, also giving off a peculiar puffing sound very easily noticed. It cannot be drawn off until the blast pressure has been reduced, which must be done gradually and carefully, or the slag will flow into the tuyeres first. The hard iron in this case could be attributed to the destruction of the metalloids, nevertheless it is a mechanical change in the mixture which would not have happened if the melting had been done properly.

The above items only apply where the iron melted does not exceed 8 tons per hour and the stack does not exceed 48 inches diameter. Neither do they apply to any particular grade of mixture. The effects would probably be the same whether hard or soft irons were melted.

Clark's Klondike Stove.

One of the requisites of those who are hurrying into the Yukon country in search of gold is a stove of such character that it can be readily carried, that it will occupy but small space, and will stand the wear and tear. A device which is said to have gained a reputation in Dawson City and out on the trail is the stove shown in the accompanying illustration, and which is being manufactured by T. F. Clark & Co., 916 Western avenue, Seattle, Wash. A down draft is used in the stove, and the manufacturers claim that the fire is taken below the fire box and under the oven when the latter is in use, and over the top when the oven is not in use. A slide damper is employed which works in the back part of the stove, the body of the latter being made of steel, ranging in gauge from No. 16 to No. 20. The stove will hold a fire for some time and the company refer to the device as making a good camp stove. The stoves are well adapted for the purpose for which they are intended and are said to have stood the test of practical use with entire satisfaction. Any kind of wood may be employed and the workmanship is referred to as being first-class.



Clark's Klondike Stove.

Kernan's 400th Series Furnace.

An eight-page folder, showing the latest construction in furnaces made by the Kernan Furnace Company, Utica, N. Y., for 1898, is just received from the New York office. It shows the 400th Series, a line of furnaces having a handsomely designed shield front and made in five sizes, and furnished with either all cast iron or steel plate radiator. Half-tone engravings show the furnace complete, and by broken views the construction and fire travel may be readily understood. One illustration shows the parts of the furnace assembled previous to erection. From the engravings it can be seen that the ash pit is high and broad and that the triangular grate can be readily removed or replaced. A large fire pot is corrugated to increase the fire surface, and the feed section and radiator contribute additional surface and effect a long fire travel. It is pointed out that there are few joints and only one exposed to the direct action of the fire. The furnace is said to have all the improvements found in the highest grades and is made of first-class material. The trade are solicited to secure the folder and study the furnace which is presented in it.

ODD PLATES.

The Bower Stove Company of New Madrid, Mo., have been incorporated, with a capital stock of $10,000, by S. S. Bower and others.

The Excelsior Stove & Repair Mfg. Company of Quincy, Ill., have recently certified to a change of name, and the business will hereafter be conducted under the style of Excelsior Stove & Mfg. Company.

The Champion Stove & Furnace Company of Springfield, Ohio, have made rapid progress in getting their plant into operation, and are now actively engaged in turning out work. Instead of starting a foundry of their own, we understand that the company have made arrangements to have the casting done by the Springfield Founding Company, located in the same building. Postmaster T. D. Wallace is vice president and treasurer of the company and will be active in the management as soon as the season is opened.

The Ringen Stove Company, St. Louis, refer very forcibly to the advisability of the dealer handling high grade goods. The following is a portion of the argument they present: "Some dealers are under the impression that hard times are going to last forever, and that as a consequence during the coming season inferior Stoves, which have held the day during our financial depression, are going to sell to almost the exclusion of good Stoves. That is not the case. Inferior Stoves have the only advantage of being cheap—they are absolutely devoid of any other advantage to either dealer or user—and good goods are as sure to come to the surface after the storm is over as the sun is sure to reappear after the clouds have passed."

The Peninsular Stove Company of Detroit, Mich., have been awarded the contract for heating the new school in District No. 1 of Ecorse.

Rathbone, Sard & Co., Wabash avenue and Randolph street, Chicago, are still in the market with a full line of Gasoline Stoves. They are now entering upon their fiftieth year in the Gasoline Stove business. At one time, it will be remembered, nearly all the leading Coal Stove manufacturers also handled Gasoline Stoves, but one by one they abandoned the line for reasons satisfactory to themselves, leaving Rathbone, Sard & Co. as the only large Stove manufacturers who persisted in this trade. This year they offer a line of Gasoline Stoves improved in every way to conform to the latest ideas. It has been their experience that many of their customers are pleased to be able to combine Coal and Gasoline Stoves in the same shipment. Several of the smaller Coal Stove manufacturers also evidently find this trade advantageous to them, as they are continuing to cultivate it.

The Gobeille Pattern Company, Cleveland, Ohio, have taken advantage of the conspicuousness of bright color in calling attention to their business. A postal card paneled in orange and green gives the name of the company, their trade-mark, a list of directors, &c.

Charles W. Day, for many years manager of the Chicago office of Sherman S. Jewett & Co. of Buffalo, N. Y., died early on the morning of February 15 at his residence in Honolulu. He was an old resident of Chicago, Ill., but left that city in 1891 for Honolulu. His son, Dr. Francis R. Day, is at present the port physician of that place.

In the death of Ralph P. Myers of Cleveland, Ohio, the Stove trade has lost one of its pioneers and the city named a well-known citizen. Mr. Myers was born at Sand Lake, N. Y., 78 years ago, and when a young man entered a dry goods establishment in Albany, afterward becoming proprietor of the house. Some time later he moved to Akron, Ohio, and commenced the manufacture of Stoves. In the fifties he went to Cleveland and started what was later known as the firm of Myers, Rouse & Co. Some years afterward he retired from the firm, who changed their title to that of Myers, Osborn & Co. Altogether, Mr. Myers was engaged in the manufacture of Stoves for something like 40 years. He died late Saturday night, February 19, and the funeral services were held at the family home on the afternoon of Tuesday, February 22.

George Auer of Delphos, Ohio, is moving to Toledo, where he will build his Furnace and Steel Range.

The Cook & Van Evera Company, Chicago, are sending out decidedly humorous pictures calling attention to their Jersey Cooks and Ranges. The artist in that company has not disclosed his identity, but he undoubtedly has talent.

TRADE REPORT.

METAL MARKET.

Pig Tin.—There has been a steady increase in prices during the last week, and the market has changed from its unsteady position and has assumed a tone of firmness. Advances have been made in correspondence with the advancing tendency of the London market. The demand is considerably better than that of last week and the fact that the visible supplies have been decreased by 1700 tons during the month of February is having a wholesome effect on the market, and is strengthening prices generally. At the close of the week under review there was a good consumptive demand. Arrivals during the last few days were quite free, but the most of it will be shipped from the dock on previous sales. Shipments of Straights for the month of February amounted to 2950 tons for Europe and America, against 4650 tons for the month previous, and against 4450 tons for February of last year. The statistical position therefore shows an improvement. It is figured by the Metal Exchange as follows : Visible supply on March 1, 1898, 28,800 tons, against 31,137 tons for February 1, 1898. For small lots we quote a slight advance on Straits.

Copper.—An exceedingly strong market is manifest with marked and rapid advances in the wholesale market. Besides the Calumet & Hecla Company, it is said that there are also several other large lake companies who are out of the market at present. There are good inquiries. Spot Copper is very scarce. The prevalent and increasing advance is coming entirely from this country, as the European market has not as yet followed it. It is stated that the home consumption has made urgent demands for deliveries, while the Copper companies claim that they are filled up with orders. Shipments to Europe for the month of February were the smallest of any one month since December, 1895. The February figures as compiled by the New York Metal Exchange are 7793 tons. Notwithstanding this low figure for February, the total exportation since January 1 compares very favorably with that of last year, having been 19,819 tons, while that of the same period last year was but 18,264 tons.

Pig Lead.—The market has been growing easier all the week and business has been quite inactive, as buyers are very reluctant. It is stated that the cutting of freight rates has much influenced the depressed feeling. The price for common domestic has taken a marked downward course, though the price for small lots is not yet affected. Foreign Lead statistics for February as figured by the Metal Exchange are as follows:

Arrivals during February, tons	4,750
Export in bond, tons	4,327
Stock in bond at nearby ports on February 28, tons	4,585

Manufactured Lead continues unchanged.

Spelter.—The market has been quiet but firm during the last week and quotations have not changed materially from those of last week.

Antimony.—There has been a slight increase over last week, the market remaining quiet.

Nickel.—Remains absolutely unchanged, last week's quotations still holding at 33c. to 37c., according to quantity and delivery.

Tin Plate.—The consolidation movement in the Tin Plate trade still demands attention, but there is no evidence that any forward steps have been taken. Consumers are holding back large purchases and business in the wholesale market is very quiet. Spot Plates are in small supply in this market and there is a somewhat firmer tone in consequence, but there is no advance to note.

Old Metals.—The market is very firm, with prices unchanged. Domestic demand is very active and a good inquiry for export is also noted for Brass. Yard dealers in this city and vicinity are paying about the following rates for moderate sized lots, delivered here:

Heavy Copper	per lb. 9⅝c.
Light and Tinned Copper	per lb. 9 c.
Heavy Brass	per lb. 6⅜c.
Light Brass	per lb. 5⅜c.
Lead	per lb. 3⅜c.
Tea Lead	per lb. 3⅛c.
Zinc	per lb. 3 c.
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$8 25
Heavy Cast Scrap, per gross ton	8.25
Stove Plate Scrap, per gross ton	5.75
Burnt Iron, per gross ton	4.25
Tin Plate Scrap, per ton	2.75

THE IRON MARKET.

The week has brought fresh evidence of how enormous is the tonnage of crude and finished Iron products which the Central West is swinging. In spite of the fact that every great Steel plant in that section is driving at top speed there are indications of a small shortage in Steel, while the Bessemer Pig Iron market displays continued activity. The purchase of the Carrie plant by the Carnegie Steel Company, who bought heavily of the product of the plant lately, takes out of the market one of the few works in the Pittsburgh district which made Mill and Foundry Iron besides Bessemer Pig. The Alabama and Tennessee furnace companies, with the exception of two, have agreed upon an arrangement under which a commissioner will supervise sales, and which may develop some plan of restriction of output. The markets for Foundry Iron need some tonic, to judge from the anxiety displayed in some sections to secure business.

Pig Iron.—The New York market is in an unsettled condition and the prices made are irregular. Nor is the volume of business large. Some of the leading melters in the district, notably the makers of plumbers' supplies, are still idle, and some foundries are carrying enough Iron to last them for some time to come. The Alabama and Tennessee makers, with the exception of Woodward & Dayton, have got together and will have sales handled by a commissioner. There is some talk of a restriction of output. We quote as follows: Northern brands, No. 1, $11 to $11.50; No. 2, $10.50 to $11; No. 2 Plain, $10 to $10.50; Gray Forge, $10 to $10.50. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.50; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

From Philadelphia our correspondent writes : There is not much room for remark in regard to this important interest. There is a fair amount of business being done, but not enough to warrant the assertion that things are better and not enough pressure to sell to say that they are any worse. Unchanged, with a possibility of a slight turn either way, according as events may shape themselves during the next ten days, is probably a fair way of estimating the situation. On the whole, prices have held very fairly, considering the anxiety to realize, but the strain in some quarters is very severe and a more active movement among buyers would be a welcome relief. For the time being there is no attempt to do more than maintain the prices recently ruling, and while this has been successful in most cases, it is conceded that the situation is unusually sensitive. A great deal of Iron is being melted, and still more will be required during the next 60 or 90 days, so that there are some hopeful features, even though they may be a little clouded temporarily. The course of events during the coming week will therefore be awaited with much interest, as they are likely to enable the trade to form a pretty good idea of what is before them for the next few weeks, if not for the whole of the summer months. Prices for seaboard deliveries are about as follows, with the usual rebate according to freights at points within a radius of 100 miles south or west: No. 1 X Foundry, $11 75 to $12; No. 2 X Foundry, $10.75 to $11; No. 2 Plain, $10.50 to $10.60.

At Pittsburgh Foundry Irons are quiet. We quote No. 1 Foundry at $10.40 to $10.50; No. 2 Foundry, $9.90 to $10; Bessemer, $10.30 to $10.40, depending on delivery; Gray Forge, $8.90.

From Cincinnati we have the following report: In general tone the market for Southern Pig Iron has been dull with some very discouraging features. Higher prices seem to be practically out of the question, and if present basis can be maintained it will give good satisfaction. The agreement reached last week by some of the Birmingham furnaces was not shared by all and consequently there are two sets of quotations, with "outside" Iron selling at prices which are disheartening when it is known that concessions regarding payments guaranteed, weights, &c., went in with the transactions. Thus some No. 2 Foundry was sold at $6.75 and No. 3 Foundry at

$6.50, Birmingham. The sales were for delivery in this territory. This is just what has been going on for two weeks at least. From other standpoints the outlook is still very fair. The consumption is excellent and growing. Stocks in consumers' hands are small. There is a fair volume of inquiry, though the actual selling is confined to the normal run of small orders, and it seems impossible to get up any degree of enthusiasm among buyers. They won't be stampeded into the market, and are calmly drifting along in a let to-morrow take care of itself sort of way which to hungry sellers is positively aggravating. We quote, f.o.b. Cincinnati :

Southern Coke, No. 1	$10.00 to $....
Southern Coke, No. 2	9.50 to ....
Southern Coke, No. 3	9.25 to ....
Southern Coke, No. 1 Soft	9.75 to ....
Southern Coke, No. 2 Soft	9.50 to ....
Ohio Silvery, No. 1	12.00 to 12.50
Ohio Silvery, No. 2	11.50 to 12.00
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00

We quote for cash as follows for the Chicago market:

Lake Superior Charcoal	$11.50 to $13.00
Local Coke Foundry, No 1	11.50 to 12.50
Local Coke Foundry, No. 2	11.00 to 12.00
Local Coke Foundry, No. 3	10.50 to 11.50
Local Scotch, No. 1	11.50 to 13.00
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.35 to 10.70
Southern Coke, No. 3	10.10 to 10.40
Southern, No. 1 Soft	10.85 to 11.00
Southern, No. 2 Soft	10.35 to 10.70
Foundry Forge	9.85 to 10.10
Gray Forge and Mottled	9.60 to 9.85
Southern Charcoal Softeners	11.35 to 11.85
Alabama and Georgia Car Wheel	14.00 to 17.00
Jackson County Silvery, according to Silicon	12.50 to 14.50

Our St. Louis advices are: The failure of the furnace representatives to come to any arrangement regarding prices is taken advantage of by consumers to depress prices. The effect is plainly noticeable in the quotations ruling to-day. The attempt to come to any arrangement regarding prices has been viewed with distrust by many large consumers, and the market would be in materially better condition had no meetings been called whatever. The impression now prevails that on account of opposition from certain sources nothing could be accomplished. While this impression may have no foundation in fact, yet the effect on the market is bad. Sales during the week have been moderately heavy and prices a trifle weak and unsettled. We quote as follows for cash, f.o.b. cars St. Louis :

Southern, No. 1 Foundry	$10.00 to $10.50
Southern, No. 2 Foundry	9.75 to 10.00
Southern, No. 3 Foundry	9.50 to 9.75
No. 1 Soft	9.75 to 10.00
No. 2 Soft	9.50 to 9.75

CHICAGO REPORT.

Scrap.—Iron is in good demand and stocks are small. Copper is higher. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	7.50	....
Malleable Cast	6.50	....
Stove Plate (free of burnt)	5.50	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas Pipe and Boiler Tubes	5.50	....
Cast Borings	3.00	....
Turnings	4.50	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	10¼c.
Copper Bottoms	....	9¼c.
Copper Clips	....	10 c.
Red Brass	....	8½c.
Yellow Brass	....	7¼c.
Light Brass	....	4¾c.
Pipe Lead	....	3 c.
Tea Lead	....	3 c.
Zinc	....	3 c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	..	1 c.

Anthracite.—An effort is being made to advance prices 25 cents, and the change may be made this week. The ruling prices of carload lots of 12 tons minimum are as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill.	$4.75	$5.00
Milwaukee, Wis	4.75	5.00
Kansas City, Mo	6.75	7.00
Council Bluffs, Iowa	6.75	7.00
Lincoln, Neb	6.90	7.15
Sioux City, Iowa	7.25	7.50
Aberdeen, S. Dak	8.00	8.25
Dubuque, Iowa	6.05	6.30
Madison, Wis	6.25	6.50
St. Paul, Minn	7.25	7.50
Burlington, Iowa	6.25	6.50
Des Moines, Iowa	6.75	7.00
Davenport, Iowa	6.05	6.30
St. Joseph, Mo	6.75	7.00
Leavenworth, Kan.	6.75	7.00
Omaha, Neb	6.75	7.00

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

The month of February was undoubtedly, on the whole, an excellent one, and the business of the year thus far is considerably in excess of 1897. Prices are without important change, the market on the whole being fairly steady. Some goods, owing to the desire of manufacturers to effect sales, are sometimes shaded, but, on the other hand, advances in other lines recently made are pretty generally maintained. All things considered, there is little ground for complaint in regard to the tone of prices. The advances for March determined upon last month in Wire Nails, Barb Wire and Plain Wire have gone into effect and these lines are thus quotably higher. The manufacturers are working together with a good deal of harmony and are endeavoring to maintain prices on these goods whether or not the plans for the consolidation of Wire interests are successfully accomplished.

Advices from Chicago.—Shelf Hardware jobbers report an extraordinary increase in their trade for February as compared with February of last year. The changed character of business, however, is notable. Then all orders were small and retailers would not stock up in advance of actual necessities. Now liberal stocks are being carried in all lines and merchants are not afraid to take some risk. The movement at present is quite heavy, and would undoubtedly be larger if country roads were in better condition. All kinds of goods are in demand, even Builders' Hardware, which is usually dull at this season. The orders placed for future delivery on summer goods are exceptionally large. Seldom have so many orders been booked for Refrigerators, Screen Doors, Window Screens, Poultry Netting and such seasonable commodities as at present. The outlook is very encouraging in every direction. A report that the Simmons Hardware Company contemplated the establishment of a branch house in Chicago is authoritatively denied.

Advices from St. Louis.—The Hardware jobbing trade continues to increase in volume, and comparison with the corresponding period of last year shows heavy gains. Prices are in nearly all cases being firmly maintained, and while there are no advances to record, on the other hand we hear of no shading of price. The demand for Wire Goods is very heavy, particularly in Plain and Barb Wire, which are being ordered liberally. Jobbers also report a largely increased demand for Field Fencing, which is now being offered by a number of manufacturers throughout the West. Galvanized Iron is selling freely, the general quotation for small lots being 80 and 5 per cent. discount. The advance in Spelter, which amounts to nearly $4 per ton. will doubtless have a benefiting effect on the price of Galvanized Iron Tin Plates are active, and a heavy demand is reported for Corrugated and Plain Iron Sheets. Screws are active and prices are being well maintained.

NOTES ON PRICES.

Wire Nails.—During the past week the Wire Nail market has not been characterized by as much activity as during the earlier part of the month. This was because of the higher prices named by the manufacturers, at which the trade are indisposed to purchase without some assurance that the market is to be maintained or perhaps advanced. The manufacturers at a meeting held in this city Wednesday confirmed the advance of 5 cents per keg for March. We quote small lots from store at $1.70 to $1.75.

Advices from Chicago.—February was an exceptionally satisfactory month for Wire Nail manufacturers. Shipments were heavy, but large as they were it is understood that manufacturers were unable in all cases to fill their contracts and deliveries will therefore run pretty well into March. Jobbers report a good trade, with many mixed carloads now going out.

Cut Nails.—The market for Cut Nails is in substantially the same condition as at our last report. The demand is moderate, but it is anticipated that it will quicken as the month advances. New York quotations are about $1.30 for small lots from store.

Advices from Chicago.—The movement of Cut Nails continues very light, with small lots from stock quoted at $1.45. The future of Cut Nails will depend very considerably on the outcome of the plan to consolidate the Wire Nail factories.

Advices from St. Louis.—There is quite an improvement to note in the demand for Cut Nails, but prices as yet have failed to respond. Jobbers ask $1.40 to $1.45, base, for small lots from store.

Advices from Pittsburgh.—The volume of business in Cut Nails is fair, but not specially heavy. A movement is on foot among Cut Nail manufacturers to come to some agreement regarding prices. It has been recognized for some time that the difference between Cut Nails and Wire Nails has been too large and that some action should be taken looking to the advancing of prices on Cut Nails.

Barb Wire.—The Barb Wire market is steady, with indications of excellent business as the season progresses. It is characterized by a firm tone, but it is conceded that much depends on the outcome of the negotiations for the control of the manufacture of the rods. If the plans are consummated somewhat higher prices are anticipated, but if they should fail of consummation it is probable that there will be something of a reaction in price.

Advices from Chicago.—Manufacturers report specifications coming in freely on contracts. Merchants everywhere have been taking Barb Wire so as to have good stocks for March in anticipation of the advance announced for this month. Wire Nails and Painted Wire have been selling at the same price for some time, but manufacturers claim with considerable force that Wire should command a higher rate, and if the spring demand proves as heavy as expected it would not be surprising to see them part company.

Smooth Wire.—There is no change in the price of Smooth Wire, except that the advance of 5 cents determined upon for March has gone into effect.

Advices from Pittsburgh.—A fairly good demand for Smooth Wire is reported, shipments in February being quite heavy. Taking effect on March 1, prices on Smooth Wire were advanced 5 cents.

Powers' Automatic Chimney Tops.—Powers Brothers, Streator, Ill., have brought out style No. 2 of their Automatic Chimney Top to meet the demand for a lower priced article. Six sets of iron mounting are packed in a box with pattern for making cover and vane. The following is the list price per dozen set of iron mounts, the list being subject to discount :

6-inch	$6.50
7 "	7.50
8 "	9.50
10 "	12.00
12 "	15.00

Glass.—The movement of Glass from factories shows somewhat of an increase, as jobbers are assorting up stocks in anticipation of spring trade. It is reported that the American Glass Company are restricting the production of large sizes of double strength Glass, owing to decreased demand. This may result from the larger use of cast polished Glass. It is announced that additional Plate Glass factories are to commence the manufacture of thin Plate Glass, which will be likely to further increase its use for the class of buildings in which double strength Glass was formerly used.

There are rumors in Glass circles of an impending advance in the price of Glass by the American Glass Company. When the advance will take place, or whether the report has been circulated to stimulate the placing of orders by jobbers, cannot be learned. It has been the general impression, however, for the past month or more among those interested in the Glass trade that prices are not likely to be reduced, and that the probabilities are that they will be higher before they are lower.

TRADE NOTES.

E. Bissell, Son & Co., auctioneers 12 Murray street, New York City, are to sell, Thursday, March 10, at 10 o'clock, for the Lalance & Grosjean Mfg. Company, several thousand cases of Peerless Enameled Steel Ware, seconds, to be sold in case lots. Also Blue, White and Gray Enameled Ware, to be sold in open lots.

The Ingersoll-Sergeant Drill Company, 26 Cortlandt street, New York, have prepared a pamphlet illustrating a few of their Compressors and presenting a quite extended list of the users of these machines. These Compressors are either steam or belt driven, and are made straight line and duplex, simple and compound. They are provided with improved intercoolers and water circulation all around the cylinders and through the heads. The design insures thorough and automatic regulation of air pressure and speed.

The Tin Plate Decorating Company, Brooklyn, N. Y., announce that they have enlarged their facilities to meet the growing demands of the trade, and finding it desirable to have their office and factory under the same roof, in order to give personal attention to the increasing details of their business, they have given up their former office at 110 John street, New York City, and will be glad to welcome their friends hereafter at their office in their works, 176-180 Front street, Brooklyn, N. Y.

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Metal and Miscellaneous Prices.

CHICAGO, MARCH 3, 1898.

Tin—

Straits pigs.....15½@15¾¢

American Tin Plates—

American Base Box Quotations.

Based on 32,000 square inches in a box, which is exactly 2 per cent. more than in the English base box of 14 x 20 Tin Plates. The American base box weighs 110 ℔ and the English base box 108 ℔.

Highest Grade Charcoal—Bright.

Size.	Base.	Contents.	Per box.
10 x 14,	110-℔	...240 sheets	$5.65
"	140-℔	" "	7.25
12 x 12,	110-℔	" "	5.75
"	140-℔	" "	7.50
14 x 20,	110-℔	....120 "	5.65
"	140-℔	" "	7.25
"	160-℔	" "	8.85
"	180-℔	" "	10.45
"	200-℔	" "	13.15

20 x 28 double the price of 14 x 20.

12½x17,	140-℔	....120 sheets	5.35
"	180-℔	" "	6.95

Second Grade Charcoal—Bright.

10 x 14,	110-℔	....240 sheets	5.10
"	140-℔	" "	6.15
12 x 12,	110-℔	" "	5.25
"	140-℔	" "	6.30
14 x 20,	110-℔	....120 "	5.10
"	140-℔	" "	6.15
"	160-℔	" "	7.25

20 x 28 double the price of 14 x 20.

Highest Grade Coke—Bright.

10 x 20,	110-℔	....240 sheets	5.75
12 x 12,	110-℔	" "	4.15
"	140-℔	" "	4.95
14 x 20,	110-℔	....120 "	4.00
"	140-℔	" "	4.85

20 x 28 double the price of 14 x 20.

20x26½,	110-℔	....120 sheets	8.00
20x29½,	110-℔	" "	8.85
20x32½,	110-℔	" "	9.90
"	140-℔	" "	12.35
20x39½,	140-℔	" "	15.00

Old English Method Quotations

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$5.25
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	6 75
	IXX, 14 x 20	8 25
	IXXX, 14 x 20	9.75
	IXXXX, 14 x 20	11.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.50
Allaway Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	4.75
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$3.75
	IC, 10 x 20	5.50
	IC, 17 x 17	7.75
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.00
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	4.50
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔	15¢
95 ℔	20¢
90 ℔	25¢
85 ℔	30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style. 20 to 30 lbs. coating	10.50@ 12.00
Worcester Grade, 12 to 14 lbs. coating	8.00@ 9.00
S T P ——— Grade, L 10 to 12 lbs. coating	7.50@ 8.00
Dean Grade. 8 to 10 lbs. coating	7.25@ 8.00

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00

	Per box of 56 sheets.
IX, 14 x 56	$12.50
IXX, 14 x 56	14.00
IX, 14 x 60	13.50
IXX, 14 x 60	15.00

Iron and Steel Sheets—

Black.

	Soft Steel.	Refined Iron.
Nos. 10 to 16	2.00¢	2.20¢
17 to 20	2 10¢	2.30¢
21 to 24	2.20¢	2.40¢
25 and 26.	2.30¢	2.50¢
27	2.40¢	2.60¢

Russia, Planished, &c. 100 ℔.

Patent Planished, ℔, A	$10.20
Patent Planished, ℔, B	9.20
Craig's Polished Sheet Steel	8½¢
U.S. Polished Sheet Steel No. 27 A	5.05¢

5% dis.

Galvanized.

First quality.....dis. 80%

Copper—*Ingot.*

Lake..... 12½@ 12¾¢
Casting Brands.....11¾@ 12¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing, (100 ℔ lots). (To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.08
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.	
Small lots	℔, 40¢
100-℔ lots	℔, 36¢
No. 2 (guaranteed over 90% pure).	
Small lots	℔, 34¢
100-℔ lots	℔, 33¢
Nickel Aluminum Casting Metal.	
Small lots	℔, 39¢
100-℔ lots	℔, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.	
Small lots	℔, 35¢
100-℔ lots	℔, 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter	℔, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter	℔, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 ℔ or more. Less quantities, 5¢ ℔ additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	℔	℔	℔
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-℔ casks	5¾¢
800-℔ casks	5.95¢
Loose sheets	6¢

Solder—

Half and Half (50 x 50)	11¢
45/55	10½¢
Extra Wiping	9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson	8¾@9¢
Hallett's	8¼@8½¢

Lead—

Soft Pig Lead	4¢
Bar	5¢
Sheet	6¢

Leader Pipes—

Corrugated.....80&10%

Eave Troughs—

Galvanized	80&25%
IC Terne	75&5%
IX Terne	75&5%
Double Bead Galvanized Lap Joint	80&25%
Double Bead Galvanized Slip Joint	80&25%
Double Bead IC Terne Lap Joint	75&5%
Double Bead IX Terne Lap Joint	75&5%

Elbows—

Adjustable Tin	70%
Spiral	50&10%
Plain Tin	70%
Plain Galvanized	70&5%

Valleys—

Galvanized	75&5%
IC Terne	70&15%
IX Terne	70&15%

Gutters—

Galvanized Roof	80%
Galvanized Quarter Circle, O. G. and Box	80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection	$2.25 square
Climax	2.20 square
The Lloyd Spanish Tiling	4.50 square
W. J. Burton & Co.'s Roll Cap	3.00 square

Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.35

Merchant & Co.'s Gothic Shingles.

		10 x 14	14 x 20
IC Tin	℔ square,	$4.75	$4.50
Galv	℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square

Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square

Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine	8 @ 12¢
Iron Paint, Bright Red	℔ 2 ¢
" " Brown	℔ 1½¢
" " Purple	℔ 2½¢
" " Ground in oil, B. Red	℔ 6½¢
" " Ground in oil, Red	℔ 6½¢
" " Ground in oil, Brown	℔ 5½¢
" " Ground in oil, Purple	℔ 6½¢
Linseed Oil, Boiled, in bbls	44¢
Linseed Oil, Raw, in bbls	42¢
Mineral Paints	1 @ 3¢
Orange Mineral	12¢
Pure White Lead in Oil	5½ @ 6 ¢
Dry White Lead in bbls	5 @ 5½¢
Red Lead, American	5¼ @ 5¾¢
Red, Venetian, English, dry	1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans	8 ¢
kegs	3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal	.34¢
Spirits Turpentine, in bbls., ℔ gal	38¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet	$1.25
Roofing Pitch, ℔ bbl of 300 ℔	$3.00

NEW YORK, MARCH 4.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₱ ℔, 40¢
100-℔ lots.....₱ ℔, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₱ ℔, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 ℔s or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₱ ℔	₱ ℔.	₱ ℔.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.56	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 ℔s 5¢ ₱ ℔ extra.

Antimony—

Cookson.....₱ ℔, 8½¢
Hallett's.....₱ ℔, 7¾@8¢
Japanese.....₱ ℔, 7½@7¾¢

Brass—Planished.....net

Roll and Sheet .....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per ℔.
¾-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.38
½-in. up to ⅝-in.	.38
⅜-in. up to ½ in.	.41
5-16-in. up to ⅜-in.	.48
¼-in. up to 5-16-in.	.65
3-10-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger	Special
2-in. to 3-in., to No. 19, inclusive	.38

35% off.

Copper & Bronze Tubing—

3¢ ₱ ℔ more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₱ ℔ 18½@19¢ basis *Ingot.*
Lake.....12½¢
Ansonia Grade Casting.....11½¢
Planished.....net
Sheet and Bolt.....15¢ ₱ ℔ basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe--

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₱ ℔, 2.00	2.25¢
Nos. 17 to 21	₱ ℔, 2.10	2.35¢
Nos. 22 to 24	₱ ℔, 2.20	2.45¢
Nos. 25 and 26	₱ ℔, 2.30	2.55¢
No. 27	₱ ℔, 2.40	2.65¢
No. 28	₱ ℔, 2.50	2.75¢
American B. B	₱ ℔, 4¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₱ ℔, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₱ ℔, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₱ ℔ 8½¢

Galvanized.

Nos. 10 to 16	₱ ℔, 12¢	30%
Nos. 17 to 21	₱ ℔, 13¢	
Nos. 22 to 24	₱ ℔, 14¢	
Nos. 25 to 26	₱ ℔, 15¢	
No. 27	₱ ℔, 16¢	
No. 28	₱ ℔, 17¢	
No. 29	₱ ℔, 19¢	
No. 30	₱ ℔, 21¢	

36 in. 1¢ ₱ ℔ higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛@4¼¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₱ ℔.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per ℔.....38¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's. 100@500 ℔..... 6 ¢
Lead. Amn. White, in oil..... 6 ¢
Lead, Red. bbls. and ⅛ bbls..... 6 ¢
Lead, Red, kegs..... 6 ¢
Ochre, American..... 1½¢
Red Venetian, American..... 1¾¢
Linseed Oil:
Raw, ₱ gal.....45@46¢
Boiled.....47@48¢
Spirits Turpentine:
In bbls.....36¢
In cases.....44¢
Putty:
In barrels and ⅛ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 ℔ casks.

Fancy Lagos.....₱ ℔ 5¼¢
Clarified.....₱ ℔ 5 ¢
Accra.....₱ ℔ 4¾¢
Half Jack.....₱ ℔ 4½¢
Cecilia.....₱ 100 ℔ $4.85
Choice Red.....₱ 100 ℔ 4.60
(*Spot Oil, ⅛c. ₱ ℔ higher.*)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline.....₱ gal. 10@11¢
Kerosene.....₱ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....75%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks 70@10%
Soldering Unions.....70%
" Nipples.....70@75%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves. 70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₱ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75%
Galvanized Iron Range Boilers above 52 gallon.....65%
N. B.—5 % extra on Standard 30, 35 and 40 gal. Boilers.
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanized Iron Range Boilers, Extra Heavy, above 52 gallon.....60%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....60%
" " " Backs Plain.....60%
" " " " Galvanized....60%
" " " Legs Plain.....60%
" " " " Galvanized....60%
" " " Backs with air chambers, Plain.....60%
Cast Iron Sinks, Backs with air chambers Galvanized.....60%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.

Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₱ ton.....$30.00@$35.00
Asphaltum, Rock. ₱ ton.....$14.00
Coal Tar Felt, 1 ply, ₱ ℔.....2¢
2 Ply Roofing, ₱ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₱ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₱ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....₱ bbl. $1.48@$1.49
Rosin, E. & F.....₱ bbl. 1.55@ 1.60
Rosin, G. & H.....₱ bbl. 1.70@ 1.80
Rosin, I. & K.....₱ bbl. 1.85@ 1.90
Rosin, M. & N.....₱ bbl. 2.10@ 2.20

Seamless Brass Tubes—

Net List, Feb. 1. 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.

Pennsylvania:

Best Bangor, ₱ sqr. .....$3.50@$4.50
No. 1 Bangor Ribbon..... 3.00@ 3.25
Pen Argyle. ₱ sqr..... 3.25@ 3.50
Peach Bottom, ₱ sqr..... 4.75@ 5.60
No. 1 Chapman, ₱ sqr.... 3.00@ 4.25
Lehigh Slates, ₱ sqr .. .. 3.25@ 3.80

Vermont:

Sea Green, ₱ sqr.....$2.45@$3.05
Purple, ₱ sqr..... 3.75@ 4.00
Variegated Purple..... 2.25@ 2.90
Unfading Green, ₱ sqr... 3.50@ 4.00
Red, ₱ sqr..... 8.50@10.50

Solder and Soldering Fluids— Solder—

½&⅓ guaranteed..... 10⅛@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f.o.b. New York.
In barrels. ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 ℔, ₱ ℔.....8½¢
½ bbls., about 300 ℔, ₱ ℔.....4¢
Kegs, about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg.
Kegs about 55 ℔, ₱ ℔.....4¢
5¢ dia.

Yager's Soldering Salts.
⅛ ℔ bottles, each.....8
Large quantities, ₱ ℔.....4

Soldering Coppers—

Per ℔.....15¢@16¢

Spelter—

Western Spelter.....4½@4.6
Bertha (pure).....7@7½

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60

Tin Pigs and Bars—

Banca, Pigs, ₱ ℔.....15½
Straits, pigs, ℔ ℔.....14¾@15
Straits, in bars, ₱ ℔.....1

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14	
		14 x 20	$4.
" "	IX,	10 x 14	
		14 x 20	5.
" "	IXX,	14 x 20	6.
" "	IXXX,	14 x 20	7.
" "	IXXXX,	14 x 20	8.
" "	DC,	12½ x 17	4.
" "	DX,	12½ x 17	5.
Allaway Grade,	IC,	10 x 14	
		14 x 20	4.
" "	IX,	10 x 14	
		14 x 20	5
" "	IXX,	14 x 20	5.
" "	IXXX,	14 x 20	6.
" "	IXXXX,	14 x 20	7.

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14	
		14 x 20	$3.50 @ 8.
" "	IX,	10 x 14	
		14 x 20	4.35 @ 4.

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 ℔.....10
95 ℔.....15
90 ℔.....20
85 ℔.....25

Terne Plates—

N. B.—The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 ℔ coating..... $11.50 @ 13.0
Redipped, or Good Old Style, 20 to 30 ℔ coating..... 10.00 @ 11.0
Worcester Grade, 12 to 14 ℔ coating..... 8.00 @ 9.2
STP Grade, 10 to 12 ℔ coating..... 6.75 @ 7.5

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.1
IXX, 14 x 28..(112 sheets)..... 9.8
IXX, 14 x 31..(112 sheets)..... 10.8

Tin Plates, Imported—

Duty, 1½¢ ₱ ℔.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20	$5.0
" "	IX,	14 x 20	6.0
Allaway Grade,	IC,	14 x 20	4.2
" "	IX,	14 x 20	5.0

Coke Plates, Bright—

Steel Coke,	IC, 14 x 20	$4.2
	IX, 14 x 20	5.2

Terne Plates—

Worcester Grade,	IC, 14 x 20	4.25
	20 x 28	8.50
Dean Grade,	IC, 14 x 20	4.00
	20 x 28	8.00
Gilbertson's Old Method,	IC, 14 x 20	7.50
	20 x 28	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.0
Steel Lock Frame, per doz..... 18.0
Daisy Improved pattern, ₱ doz... 18.0

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 189

1¼ and less, Plain....57&10&10&10&10
1¼ and less, Galv. 50&10&10&10&10
1½ and larger, Plain..67&10&10&10&10
1½ and larger, Galv..55&10&10&10&10
Screw and Socket Joint Casing.....65
Inserted Joint Casing.....60
Boiler Tubes, 2¼ inch and smaller.72½
" 2½ inch and larger 75

Zinc—

600 ℔ casks ₱ ℔ 5¾¢ | Per ℔.....6¼

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Wheeler, Russel & Son, Utica, N. Y.

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I. X. L. Beer Pump Co., Phila., Pa.

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Wolff, L. Mfg. Co., Chicago, Ill.

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Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

Building Paper.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

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Bliss, E. W. Co., Brooklyn, N. Y.
Gordon, W. J., Phila., Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

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Cheney, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co. Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Northrop, H. S., 40 Cherry St., N. Y.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Chafing Dishes.
Hill, Whitney & Wood Co., Boston, Mass.

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Crawford & Young, Boston, Mass.

Cocks, Ball, Basin and Stop.
Landers, Frary & Clark, New Britain, Conn.
Peck, Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Coun.

Conductor Pipe and Elbows.
Art Metal Relief Co., Covington, Ky.
Berger Bros. Co., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N.Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh Pa.
Marlin & Co., Pittsburgh, Pa.

Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Ferracute Machine Co., Bridgeton, N.J.
Keene, Geo. O. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Covering, Pipe and Boiler.
Johns H. W. Mfg. Co., 100 William St., N Y.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, Ohio.

Dampers.
Berger Bros. Co., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Distillers, Water.
Ruud Mfg. Co, Allegheny, Pa.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dumb Waiters.
Energy Mfg. Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Bowers, L. M & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Hangers.
Baker, J. R. & Sons Co., Kendallville, Ind.
Bell, Jno. W. & Co., Mercer, Pa.

Eave Trough Machinery.
Universal Machine Co., Canton, Ohio

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

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Eddy Electric Mfg. Co., Windsor, Conn.

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Eddy Electric Mfg. Co., Windsor, Coun.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

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St. Louis Stamping Co., St. Louis, Mo.

Expansion Tanks.
Koven, L. O. & Bro., 18 Spruce St., N. Y.

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Wheeler, Russel & Son, Utica, N. Y.

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Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Felt.
Johns. H. W. Mfg. Co., 100 William St., N. Y.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William. Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Carton Furnace Co., Utica, N. Y.
Detroit Fce. & Heat. Co., Detroit, Mich.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Gibiin & Co., Utica, N.Y.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Pease, J. F., Fce Co., Syracuse, N. Y.
Peck, Williamson Heating & Ventilating Co., Cincinnati, O.
Richmond Stove Co., Norwich, Ct.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N.Y.
Tubular Heating & Ventilating Co., Phila., Pa.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Hull, M. L., Cleveland, O.

Galvanized Ware.
Keen & Hagerty Mfg. Co., Baltimore, Md.

Gas Heaters. (*See Stoves and Ranges, Gas.*)

Gas Machines.
Colt, J. B. & Co., 115-117 Nassau St., N. Y.
Kent, C. M. Mfg. Co., Baltimore, Md.

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St. Louis Stamping Co., St. Louis, Mo.

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Jackson, W. Sons, 246 Front St., N. Y.

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Whelan, Dennis. J., Troy, N. Y.

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Palmer, I. E, Middletown, Ct.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

Heaters, Steam and Hot Water.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y,
Drake, W. H., Newark, N. J.
Empire Heating Co., Easton, Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 93 Liberty St., New York.
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Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse Co., Utica, N. Y.
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Kellogg-Mackay-Cameron Co., Chicago, Ill.
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Putnam Foundry & Machine Co., Putnam, Conn.
Richmond Stove Co., Norwich, Conn.
Smith Co., H. B., 135 Centre St., N. Y.
Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

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Griswold Mfg. Co., Erie, Pa.
Kieckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

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Illinois Pure Aluminum Co., Lemont, Ill.

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Dover Stamping Co., Boston, Mass.
Parks & Parks, Troy, N. Y.

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Iron, Kalameined.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. (*See Sheets, Iron and Steel.*)

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Kitchen Specialties,
Dover Stamping Co., Boston, Mass.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Schratwiesers Metal Lath Works.

Lavatories.
Wheeler, E. S. & Co., New Haven, Ct.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. (*See Ceilings, Metallic.*)

Mica.
Munsell, Eugene & Co., 218 Water St., New York.

Milk Cans.
Kieckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Molding Frames.
Acme Machine Co., Cincinnati, O.

Nickel Plating Outfits.
Eddy Electric Mfg Co., Windsor, Conn.
Upham Ely C., 35 Dey St., N. Y.

Oil Heaters. (*See Stoves and Ranges, Oil, Vapor and Gasoline.*)

Ovens, Portable.
Franke, H, Cleveland, Ohio.

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Howson & Howson, Philadelphia, Pa.
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Cope, Geo. W., Detroit, Mich.
Gobeille Patteru Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

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Dixon, Jos. Crucible Co., Jersey City, N. J.

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Millar, C. & Son, Utica, N. Y.

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Barstow Stove Co., Providence, R. I.
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Crawford & Young, Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Landers, Frary & Clark, New Britain, Conn.
National Pipe Bending Co., New Haven, Conn.
Peck Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wheeler, E. S. & Co., New Haven, Ct.
Wilson. R. M. Mfg. Co., Rome, N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St. Brooklyn, N. Y.

Presses and Dies.
Adriance Mach. Works, Brooklyn, N.Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Ferracute Machine Co., Bridgeton, N.J.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
West Mfg. Co., Buffalo, N. Y.

Pumps.
Russler, H. B., Johnstown, O.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Oil.
Dangler Stove & Mfg. Co., Cincinnati Ohio.

Radiators, Steam and Hot Water.
Fowler & Wolfe Mfg. Co., Phila., Pa.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.

Range Boilers.
Koven, L. O. & Bro., 18 Spruce St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Bowen Mfg. Co., Fond du Lac, Wis.
Challenge Corn Planter Co., Grand Haven, Mich.
Gurney Refrigerator Co., Fond du Lac, Wis.

Registers.
Excelsior Steel Furnace Co., Chicago, Ill.
Highton, Wm. & Sons, Boston, Mass.

Roofing, Asphalt.
Perkins, J. L. & Co., Chicago, Ill.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
Perkins, J. L. & Co., Chicago, Ill.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Bowers, L. M. & Co., Binghamton, N.Y.
Burton, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N.Y.

Roofing Seamers.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N.Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Acme Machine Co., Cincinnati, O.
Adriance Mach. Works, Brooklyn, N.Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Ferracute Machine Co., Bridgeton, N.J.
Keene, Geo. C. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Poorman Mfg. Co., Piqua, Ohio.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co. Brooklyn, N. Y.
Universal Machine Co., Canton, Ohio.
West Mfg. Co., Buffalo, N. Y.
Whelan, Dennis J., Troy, N. Y.

Sheet Metal Work.

Art Metal Relief Co., Covington, Ky.

Sheets, Iron and Steel.

Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Sheets, Galvanized.

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.

Burden, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Iron City Mfg. Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Slate Dresser.

Marks, F. R., Ashland, O

Slaters Tools.

Hait, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.

Whelan, Dennis J., Troy, N. Y.

Snow Guards.

Hallday, M., East 9th St., N. Y.

Solder.

Bruce & Cook, 186 to 190 Water St., N. Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.

Hull, M. L., Cleveland, O.

Speaking Tubes and Whistles.

Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties, Sheet Metal.

Vogel, Wm. & Bros, Brooklyn, N. Y.

Stamped Ware, Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.

Steam and Gas Fitters' Supplies.

Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.

Steel Stamps and Stencil Dies.

Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.

Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.

Hoffman, Geo. W., Indianapolis, Ind.

Stove Patterns.

Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros. Co., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.

Parks & Parks, Troy, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.

Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stoves and Ranges.

Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Champion Steel Rango Co., Cleveland, Ohio.
Magee Furnace Co., Boston, Mass
Peninsular Stove Co., Detroit, Mich.
Portsmouth Stove & Range Co., Portsmouth, O.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Sheppard, Isaac A. & Co., Phila., Pa.
Syracuse Stove Works, Syracuse, N. Y.
Weir Stove Co., Taunton, Mass.
White-Warner Co., Taunton, Mass.

Stoves and Ranges, Gas.

Griswold Mfg. Co., Erie, Pa.
Ringen Stove Co., St. Louis, Mo.
Standard Lighting Co., Cleveland, O.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Dangler Stove & Mfg. Co., Cleveland, O.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.

Tea Kettles.

Hill-Whitney & Wood Co., Boston, Mass.
Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

Tinners' Tools, Machines and Supplies.

Berger, L. D., Philadelphia, Pa.
Berger Bros. Co., Phila., Pa
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher, A. F. & Co., 31 Fulton St., N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.

Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate. (*Mfrs. of.*)

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Berger, L. D., Philadelphia, Pa.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Ellwood Tin Plate Co., Ellwood City, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.

Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kieckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.

Armstrong Mfg. Co., Bridgeport, Conn.
Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Valves.

Eastwood Wire Mfg. Co., Belleville, N. J.
Goodrich, Judson A. Co., 120 Beekman St., N. Y.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.

Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

Washtubs.

Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.

Marston, I. G. & Co., Boston, Mass.

Water Closets.

Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Pock Bros. & Co., New Haven, Conn.
Wolff, L. Mfg. Co., Chicago, Ill.

Water Heaters.

Kemp, C. M. Mfg. Co., Baltimore, Md.
Ruud Mfg. Co., Allegheny, Pa.

Wind Gates.

Miner & Peck Mfg. Co., New Haven, Ct

SEE ALPHABETICAL INDEX, PAGE 61.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

A FOUNDRY FOREMAN for a gray iron shop employing 60 molders, about half of whom are bench molders and the remainder floor molders; in reply give age, experience, recent employers and ability for turning out work cheaply. "V. V.," office of *The Metal Worker*, 232-238 William street, New York. Mar. 5

At once, several good SHEET METAL WORKERS. Address, with particulars, U. S. Head-Light Company, Utica, N. Y. Mar. 5

A SALESMAN in New York City, now visiting the building trade in the interests of hot water and steam goods; to also handle a very marketable line of ranges; new goods just brought out. "Western," office of *The Metal Worker*, 232-238 William street, New York City. Mar. 5

A young single man who has served an apprenticeship at the tinners' trade, and who understands something about working in a hardware store; must give recommendations as to honesty and speak English and German; steady job to right man; must be a hustler. G. B. Lahr, Juda, Wis. Mar. 5

SALESMAN thoroughly acquainted with tin plate and metal trade, by New York wholesale house. Address, giving references and experience, "Competent," office of *The Metal Worker*. 232-238 William street, New York City. Mar. 5

An A1 PLUMBER, TINNER, STEAM and HOT WATER FITTER; must be perfectly temperate and must have first-class references; state wages; to the right mau steady work. P. E. Fraleigh, Red Hook, N. Y. Mar. 5

A first-class TINNER at inside and outside work; must understand bicycle repairing, wood and iron pump, wind mill work; also be able to clerk in store if required; none but first-class men need apply. Apply with references and wages wanted. Howell & Co., Woodhull, Ill. Mar. 5

HARDWARE SALESMAN who has had from one to five years' experience; would prefer one who understands bookkeeping and a little about buggies and farm machinery. A. R. Kanney, Greenspring, Ohio. Feb. 26

A first-class TIN and SHEET IRON WORKER who understands plumbing, steam fitting, &c.; must be sober; state wages wanted and particulars. John C. Rice, 34 West Main street, Johnstown, N. Y. Feb. 26

TRAVELING SALESMEN to sell staple article in the tin and hardware line on commission; must come well recommended "Salesmen," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 26

A CORNICE MAKER; applicant must be capable and willing to do anything connected with the cornice, skylight and tin roofing business, inside and out, and competent to be left in charge; must be able to prove himself thoroughly reliable iu all respects. "Conn," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

Good STOVE SALESMAN for Illinois, Iowa, Minnesota; on commission for a good line. "Illinois," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 26

Competent man as FOREMAN of sheet metal works. Address, stating qualifications and salary expected, "Sheet Metal," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Feb. 26

By April 1 a first-class TINNER; one who understands roofing, jobbing, tinware, furnace work, stove and range repairing, and can do common jobs of plumbing and pipe work; must be strictly temperate and reliable; steady work for the right man. Lock Box No. 243, Palmyra, N. Y. Feb. 26

An experienced TINNER who can do all work that comes to a country tin shop, estimate and lay out work; must understand roofing and some plumbiug; state age and wages wanted. Lock Box 242, Stockton, Ill. Feb. 26

First-class FOREMAN for Montana to take charge of plumbing, hot water and steam heating department; one accustomed to job work and estimating; state wages and give references. "G. F.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

SITUATIONS WANTED.

TINSMITH and FURNACEMAN; seven years' experience; city or country; some knowledge of piping and plumbing; strictly temperate and industrious; desires a steady job; state wages given. Alger A. Cragin, Temple, N. H. Mar. 5

Steady position by a TIN and SHEET IRON WORKER; experience at tin roofing, pump, iron pipe, kitchen boiler connections and inside work; steady and sober; references. Box 246, Cato, N. Y. Mar. 5

A young man of strict integrity and exemplary habits desires a permanent position in a stove, tin or hardware store; ten years' experience; is a practical tinner; capable of taking charge; can furnish bonds if necessary or references of a character as to leave no doubt as to his ability aud worthiness; resigned last position. Rodgers, 57 West Fifty-third street, New York City. Mar. 5

As FOREMAN in a first-class tin shop or factory; iron or tin work; can do anything in the tin line; strictly temperate; references exchanged. "W. M.," Box 64, Tallmadge, Ohio. Mar. 5

By a good all around TINSMITH: also a good plumber; city or country. Harry Rosenbloom, 152 East Broadway, New York City. Mar. 5

By a first-class CUTTER and DRAFTSMAN, and understands all branches of the business; have been acting as foreman for four years; willing to go anywhere. H. L. Turner, 8 Trenton place, Houston, Texas. Mar. 5

As SUPERINTENDENT in the manufacture of cornices, skylight and ventilation work; practical at all branches of the trade; estimates carefully; sober and reliable; 20 years' experience. "A. J. B.," office of *The Metal Worker*. 232-238 William street, New York City. Mar. 5

By a PLUMBER; city or country; wages moderate. T. C. Doyle, 620 East 160th street, New York City. Mar. 5

By a PLUMBER; city or country; wages moderate. A. O. Wickers, 179 East Ninety-sixth street, New York City. Mar. 5

By a first-class TIN and SHEET IRON WORKER; also do slate work; will work cheap. Chas. Greer, 370 East Union street, Circleville, Ohio. Mar. 5

By a man of family; steady, sober, everyday workman, with 20 years' experience at TIN, SHEET IRON, HOT AIR, HEATING, PUMP WORK and COUNTRY PLUMBING; one who gives satisfaction to employer and customer. "Satisfaction," office of *The Metal Worker*, 232-238 William street, New York City. Mar. 5

As PLUMBER'S HELPER; two years' experience; city or country. O. Ruhlfing, care T. C. Doyle, 620 East 160th street, New York City. Mar. 5

By a first-class TIN and SHEET IRON WORKER for in and outside work; experienced in mill work, blow pipe, ventilating and general jobbing; can draw own patterns; 28 years of age; sober and reliable; would go anywhere. M. Bloom, 704 South Fifth street, Philadelphia, Pa. Mar. 5

As TINSMITH by a young married man; seven years' experience at inside and outside work and everything usually done in a country town; good reference; state wages. J. D. Wade, Toms River, N. J. Mar. 5

By a young man 23 years of age who has had six years' experience at tinning, plumbing, range, furnace and milk can work; can repair wind mills: references. Alfred B. Elwell, Pawling, N. Y. Mar. 5

By a young man 18 years of age as first-class PLUMBER'S HELPER; steady position; city or country. M. Seaman, 69 Rivington street, New York City. Mar. 5

By an all around WROUGHT STEEL RANGE BUILDER; well posted on steel cooking apparatus; can furnish necessary bench tools. "Steel Worker," 136 Bates street, Detroit, Mich. Mar. 5

By a practical PLUMBER, STEAM, HOT WATER and GAS FITTER; 13 years' experience; married and steady; reference furnished. Porter, Box 299, Peterboro, Ont. Mar. 5

As FOREMAN and CUTTER in cornice shop; used to large shop where there are many men employed: reference. W. C. Weinert, 6426 Loomis street, Chicago, Ill. Mar. 5

A stove man of experience wishes to secure the sale of a first-class line of stoves for New York State on a liberal commission basis; highest references. "Stoves," 192 Hoyt street, Buffalo, N. Y. Mar. 5

By a good all around TINSMITH; used to all kinds of furnace work, tin roofing, iron piping and all jobbing and general repairing; some knowledge of plumbing; sober and industrious; single; wages moderate; references given. Fred. Bodle, care Brown Bros., Montgomery, N. Y. Mar. 5

By a first-class TINSMITH; 25 years' experience; first-class on tinware and copper boilers, general jobbing, &c.; 45 years of age at liberty after March 3; would like position as foreman of shop. Chas. Hoag, Downsville, N. Y. Mar. 5

A general SHEET METAL WORKER (29) for light and heavy work; also cornice and skylight; competent cutter in all its branches; experienced on hand and power cornice bending machinery; position will be taken in any part of the United States where first-class work is required. "B. S.," 131 Lorimer street, Brooklyn, N. Y. Mar. 5

As BOOKKEEPER by a man who has had 19 years' experience as head bookkeeper in a large plumbing supply house; can give reference, and desires permanent engagement with a good house. "Plumbum," office of *The Metal Worker*, 232-283 William street, New York City. Mar. 5

By good PLUMBER and GAS FITTER of 12 years' experience; learned trade and worked at same in Chicago for ten years; am in business at present time, but prefer a steady job in country town; have been employed iu town of 10,000 during 1893-94-95; can give best of references from city or country; have figured plans for the last five years. A. J. Krauch, 278 Larrabee street, Chicago, Ill. Mar. 5

Experienced STOVE PATTERN FITTER and METAL PATTERN MAKER; steady job wanted. Richard Schulze, 6 Hoffman street, Allegheny, Pa. Feb. 26

By TINSMITH of ten years' experience; good on furnaces, roofing and all work around a country job shop; sober and steady; position by the year wanted; can give good references; wages moderate. E. B. Peck, York, Livingston County, N. Y. Feb. 26

By a good all around TINSMITH at roofing, assortment or furnace work and all kinds of general job work; will work reasonable; am married; have had 12 years' experience. "J. K.," 248 Trenton avenue, Buffalo, N. Y. Feb. 26

By a competent young man who understands plumbing thoroughly; also outside tin work; wages, $12 per week. R. B. Robinson, Center Moriches, N. Y. Feb. 26

By TIN and SHEET IRON WORKER; 25 years' experience; last ten years as foreman; thoroughly understands furnace work and ventilation, can lay out work, and make estimates on furnace work, hot water or steam and ventilation; should prefer Chicago or that vicinity. "G. H. C.," care of Boston office. 70 Kilby street. Feb. 26

By a first-class PLUMBER, STEAM, HOT WATER and GAS FITTER; has license for New York City; can take charge and lay out work. John Glass, 435 West Thirtieth street, New York City. Feb. 26

By a registered PLUMBER, GAS and STEAM FITTER; nine years' experience; will work in city or country. Wm. H. Ahn, Norristown, Pa. Feb. 26

A competent MECHANICAL ENGINEER of 12 years' experieuce, sober and industrious, capable of taking charge of steam engine and dynamo and of making all repairs, good practical knowledge of electrical work, wiring, &c., also of steam heating, desires position; good references as to capability and character. J. A. Wright, Floral Park, L. I., N. Y. Feb. 26

As DRAFTSMAN and CUTTER or as general workman with a reliable cornice firm by a thoroughly competent, reliable and experienced mechanic at all branches of cornice, tiu and sheet iron work; sober and industrious. "A Hammersman," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

By a TINNER and GENERAL JOBBER; good workman at roofing, spouting, &c. Irving Werner, Phillipsburg, Pa. Feb. 26

By an all around TINSMITH and SHEET IRON WORKER; 18 years' experience; also slating and bicycle work. "W. C.," Tarrytown, N. Y. Feb. 26

By a CORNICE MAN of wide experience at estimating, cutting and superintending; thoroughly up to date in all requirements; position in large shop preferred. "F. W.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

FOUNDRY FOREMAN; 18 years' experience in all branches of stove manufacture; steady, sober and can be depended on; can take entire charge of foundry and mounting room; will work to interest of employer; reasonable salary. "L. L.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

By a first-class PLUMBER; thoroughly competent at all branches; can give best of reference. "J. B.," office of *The Metal Worker*, 232-238 Willaim street, New York City. Feb. 26

To sell in the New England States, a first-class line of stoves and furnaces on commission; advertiser is able to do a large business; can furnish best of references. "M. F.," office of *The Metal Worker*, 232-238 William street, New York City. Feb. 26

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The Hardware, Stove and Tin business of the late George Baker of Philmont, N. Y. This is an old established business, and a first-class opening for a live hardwareman. For further particulars address

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Stove and Tinware business of 30 years' standing, in a flourishing manufacturing city of Northern Ohio, County Seat of Lorain Co. Administrator wishes to settle up the estate at once. Rare opportunity for man with moderate capital. Address

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Tin Shop, with one-story building, on a leading thoroughfare of Brooklyn. Will sell shop alone if desired. For further particulars address

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AGENCY WANTED. By an old established Furnace house, who are favorably known and have a fine salesroom in New York City, the agency for a first-class line of Steam and Hot Water Boilers for New York City and vicinity. Parties manufacturing such a line and who are not represented in New York City will find this a good opportunity to increase the sale of their line of goods. Address "HEATING," office of *The Metal Worker*, 232-238 William St., New York.

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A. C. STONE, Administrator,
Claremont, N. H.

Special Notices.

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office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, O.

FOR SALE. A successful Plumbing, Heating and Tin business in a prosperous country place on Long Island near New York City. Employs three to four men constantly. Will sell outright on easy terms, lease or exchange for good real estate. Reason for selling, poor health. "L. I.," office of *The Metal Worker*, 232-238 William St., N. Y.

FOR SALE.

I will sell cheap an old established Furnace Range, Roofing and Jobbing shop. On leading business street. I am now manufacturing tinware and cannot attend to both businesses. A good chance for one or two men who understand the business. No charge for good will. Work coming in every day.

JOHN W. WALLACE,
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Second-hand Cornice Brake. In good condition. Cheap.

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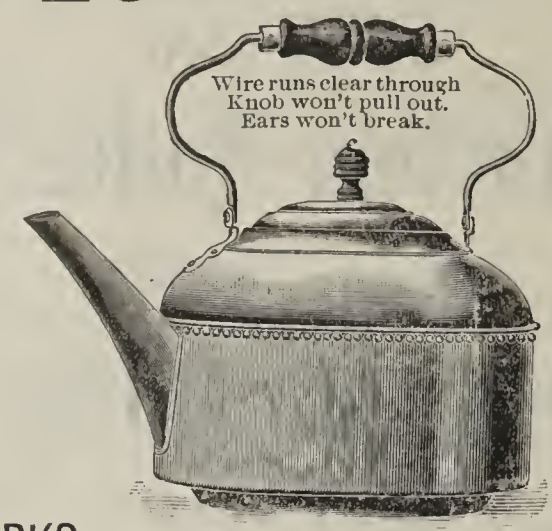
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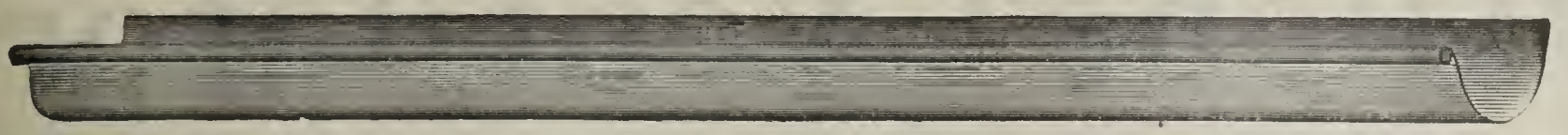
Fig. 107.—Planishing Tea-Kettle Side.

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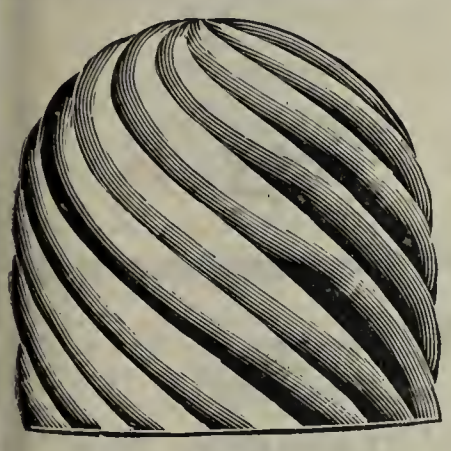




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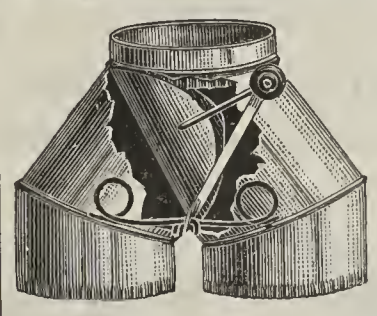
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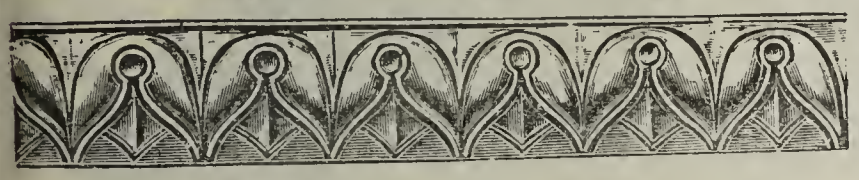
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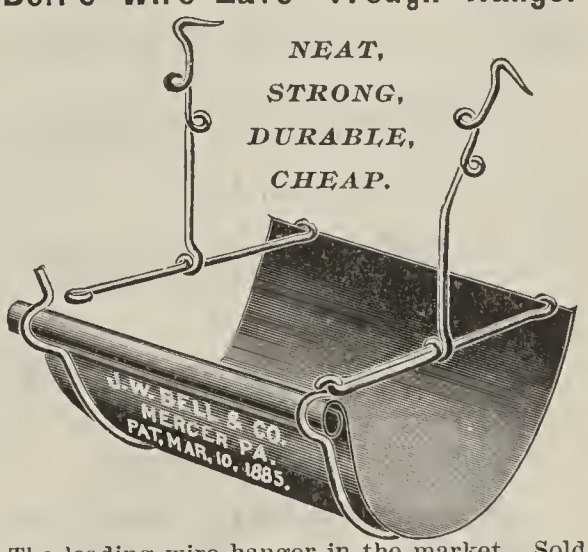
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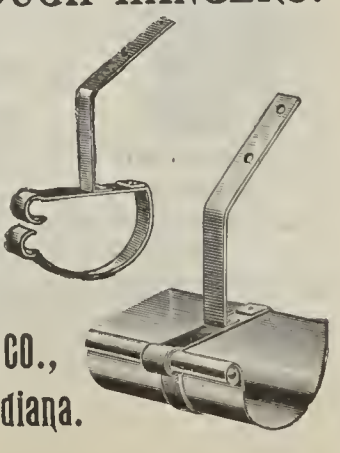
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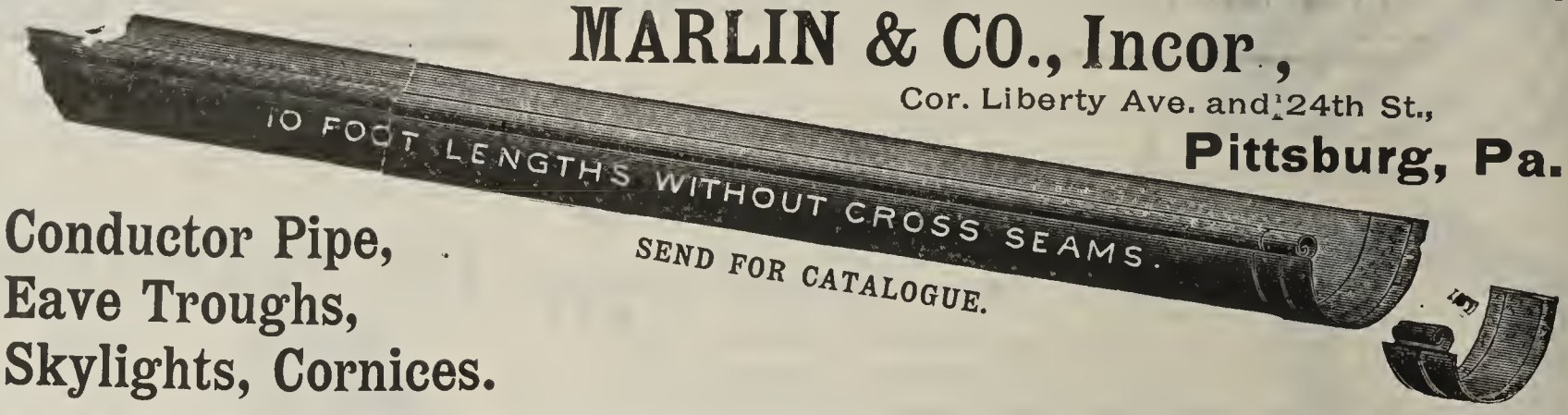
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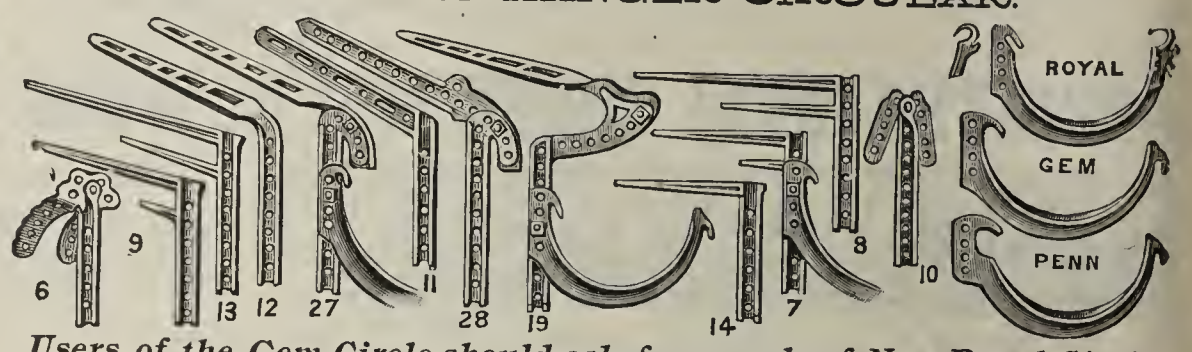
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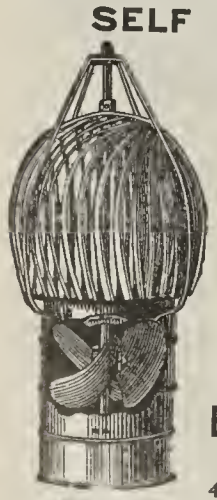
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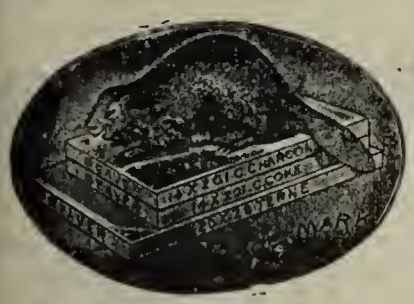
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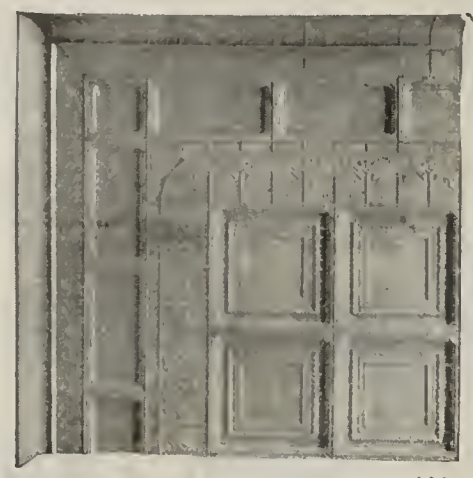
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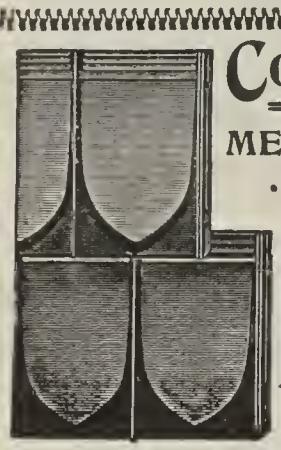
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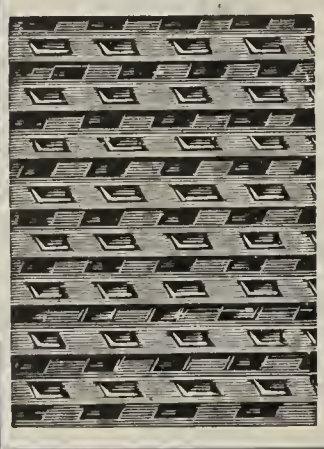
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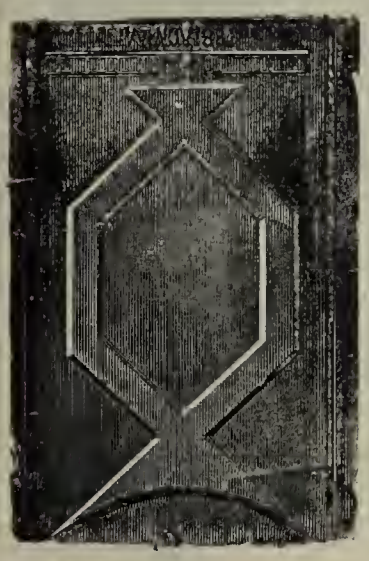
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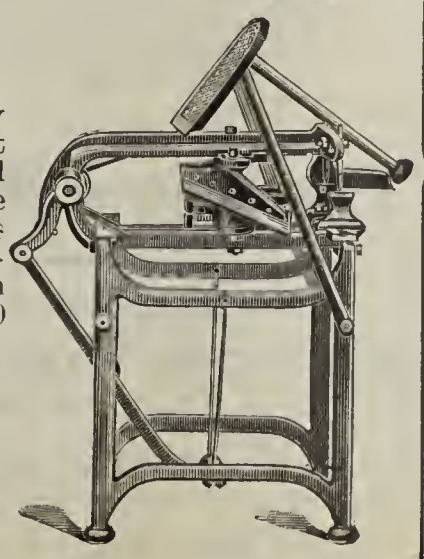


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—Cabby Scored as Usual.—A certain well-known gentleman of title is known to be very close, and on one occasion tendered a cabman a shilling for driving him from Bond street to Victoria Station. This roused the ire of the cabby, who, examining the shilling critically, sarcastically inquired whether it was a good one.

"Yes, my man," drawled the Duke, "and I require no impudence, either."

"But, can't you make it eighteenpence?" pleaded the cabman, coaxingly.

"Certainly not," replied the Duke; "besides, you came a long way round. Why didn't you cut through St. James's Park, my man?"

"'Cose it's closed," replied the cabby, after a moment's hesitation, "that's why."

"Closed. Why, how's that?"

"Well, they said as the Dook lost a three-pennypiece in there, and the park is closed until they find it."—*Pearson's Weekly.*

—Anecdote of Speaker Reed.—The speech which goes down into history as Reed's first effort as a child was short, but the one which opened his way to fame as a man was shorter still. It was delivered not long after he began his career in Congress. He had not up to that time taken much part in debate, but one day, while he was making a somewhat labored argument, an old member tried to break him up by putting a question to him suddenly and demanding an immediate answer. Reed gave the answer readily. Then he paused, turned toward the desk, and drawled out: "And now, having embalmed that fly in the liquid amber of my remarks, I will go on again." The House roared. The galleries took it up. The newspaper correspondents sent it flying all over the country, and to his own surprise more than any one's else, Reed found himself a man of note from that hour.—*The Illustrated American.*



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—ADJOURNED HIS QUIETUS.—On August 14 two teams of full-blooded Choctaw Indians from the reservation in Indian Territory played in Kansas City a game of Indian ball, which is a cross between tennis and football.

As soon as the game is over, one of the players, Wah Te Nish, will hasten to Tuskahomma, Indian Territory, where he is under sentence to be shot for murder. The fact that one of the players is under sentence of death would probably not have been known had it not been that the Indians had been engaged to play here August 1, and that it was found necessary to postpone the game until next Saturday. Then it turned out that one of the principal players had another engagement for that day—that on Saturday he was to be shot for murder. Application was made to the Choctaw Governor for a postponement of the execution, in order that Wah Te Nish might take part in the bal lgame here, and the request was granted.

Wah Te Nish is under no form of restraint, excepting that if traditional Indian honor, and it will be absolutely on his own motion that he will go from Kansas City to his death next Saturday night.

Murderers condemned under Indian laws in the Territory are never imprisoned, but are trusted to be on hand on the date of the execution, and it is said that only one man has ever failed to keep his appointment.—*New York Journal.*

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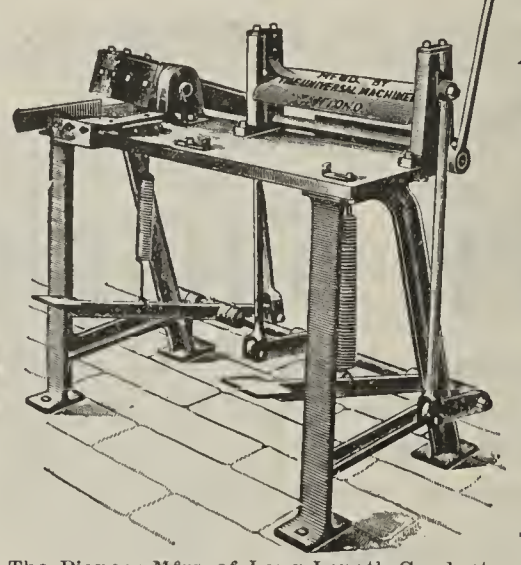
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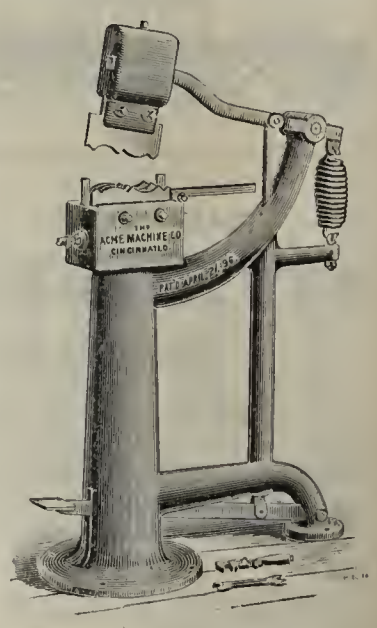
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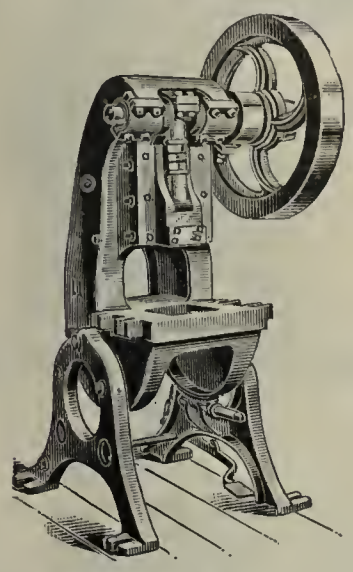
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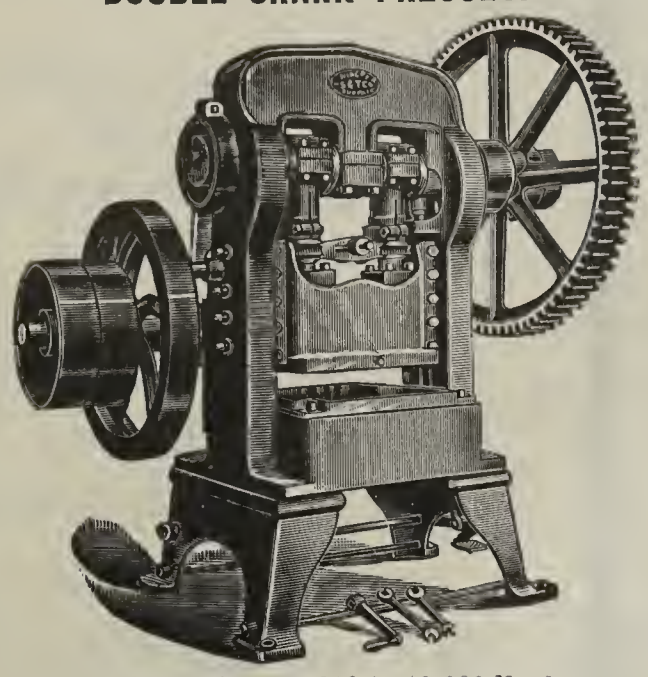
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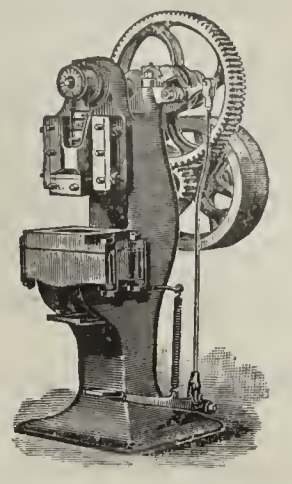


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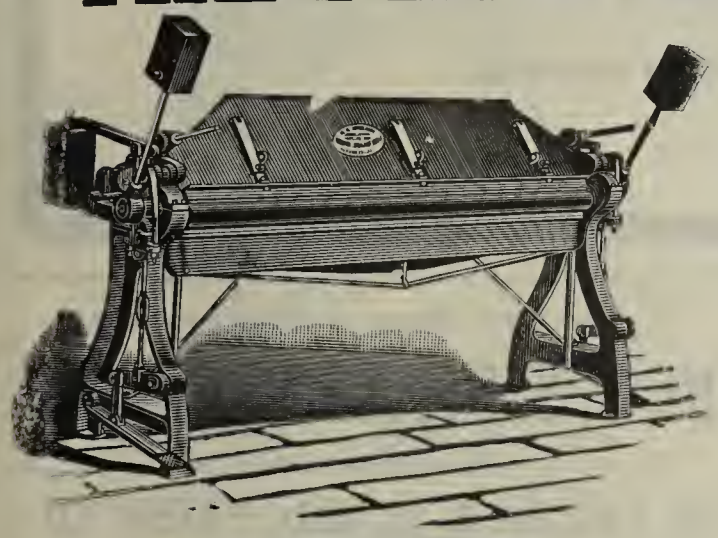
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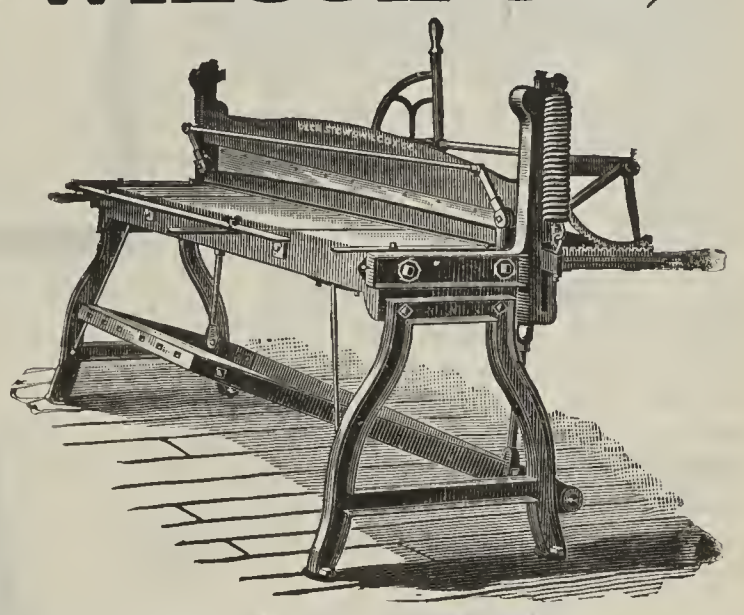
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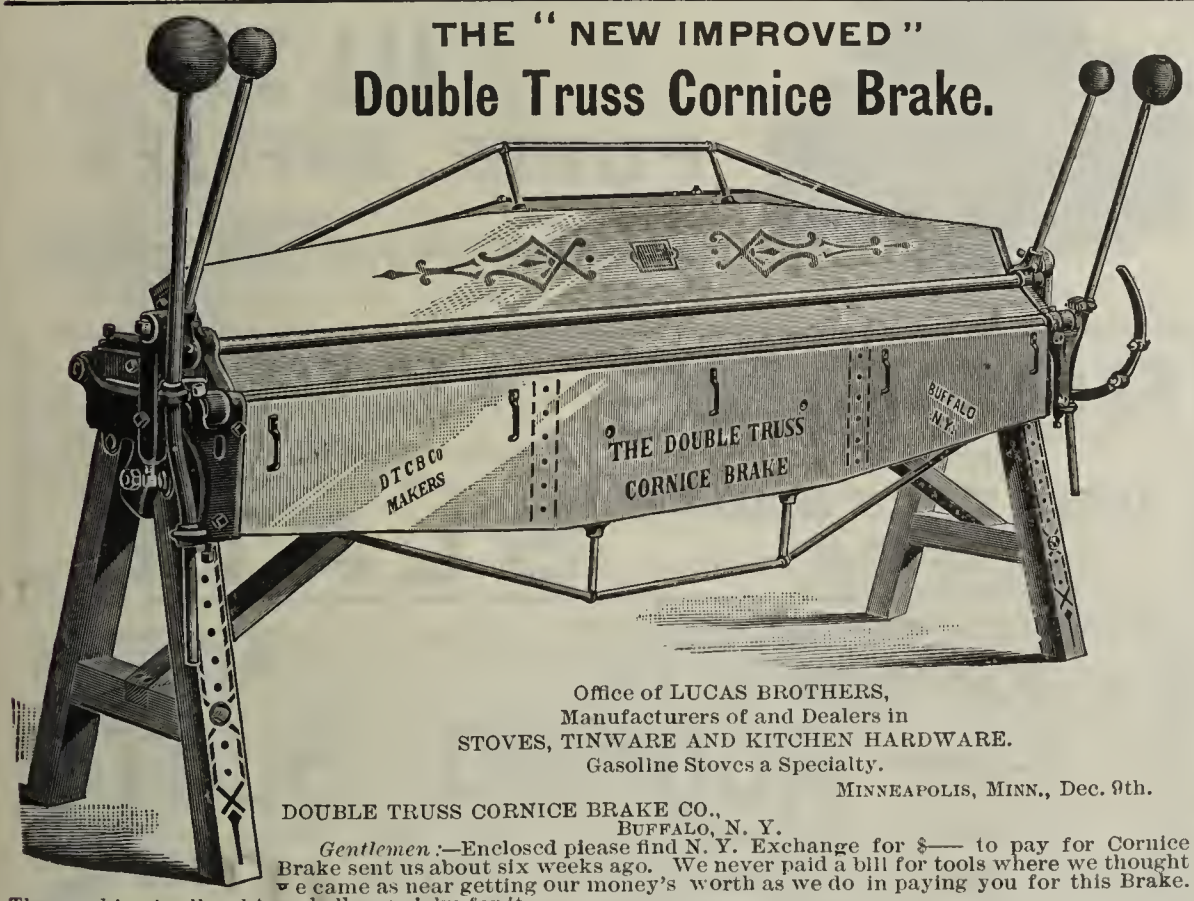


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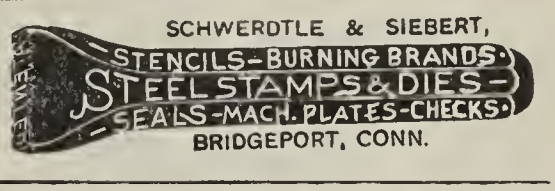
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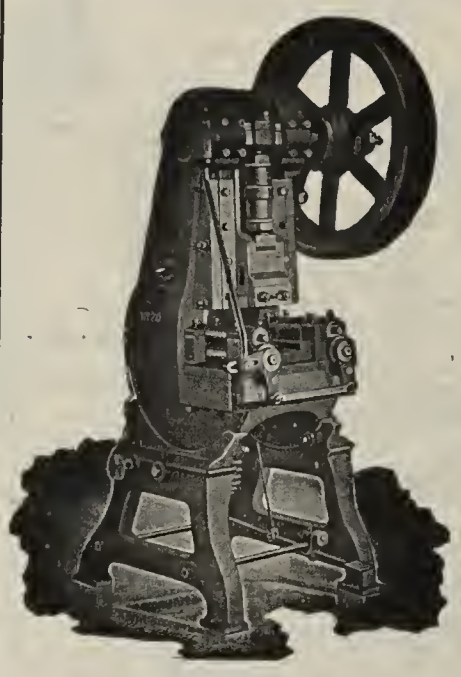
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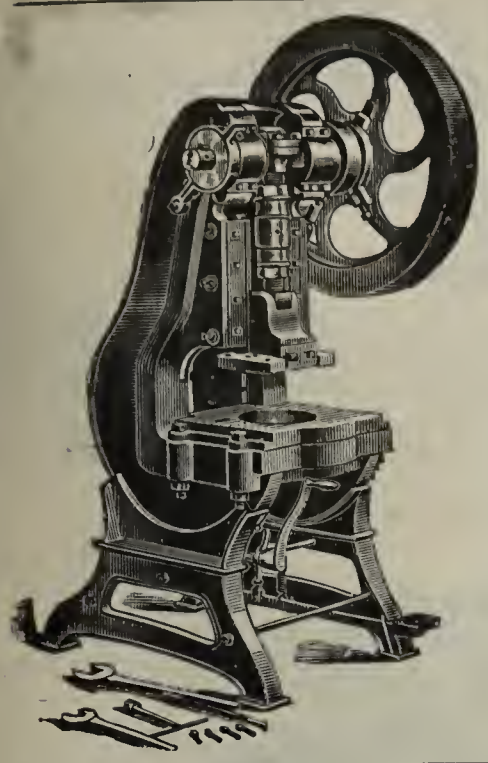
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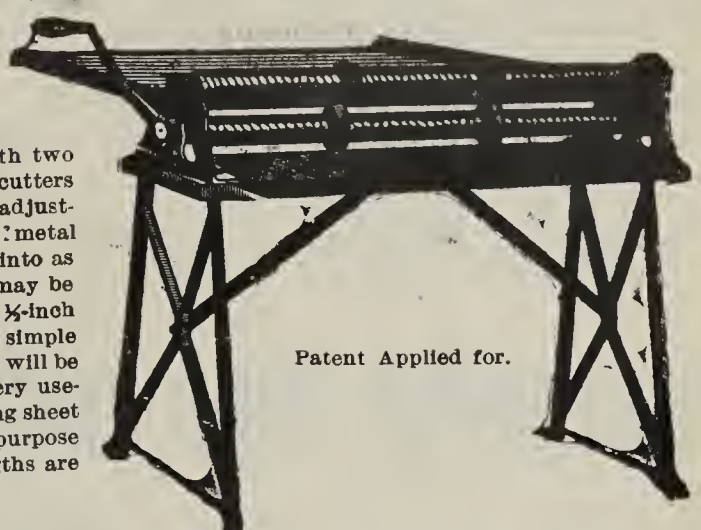
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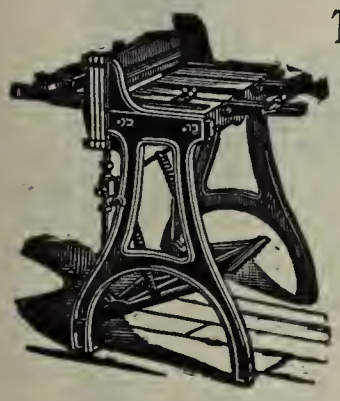
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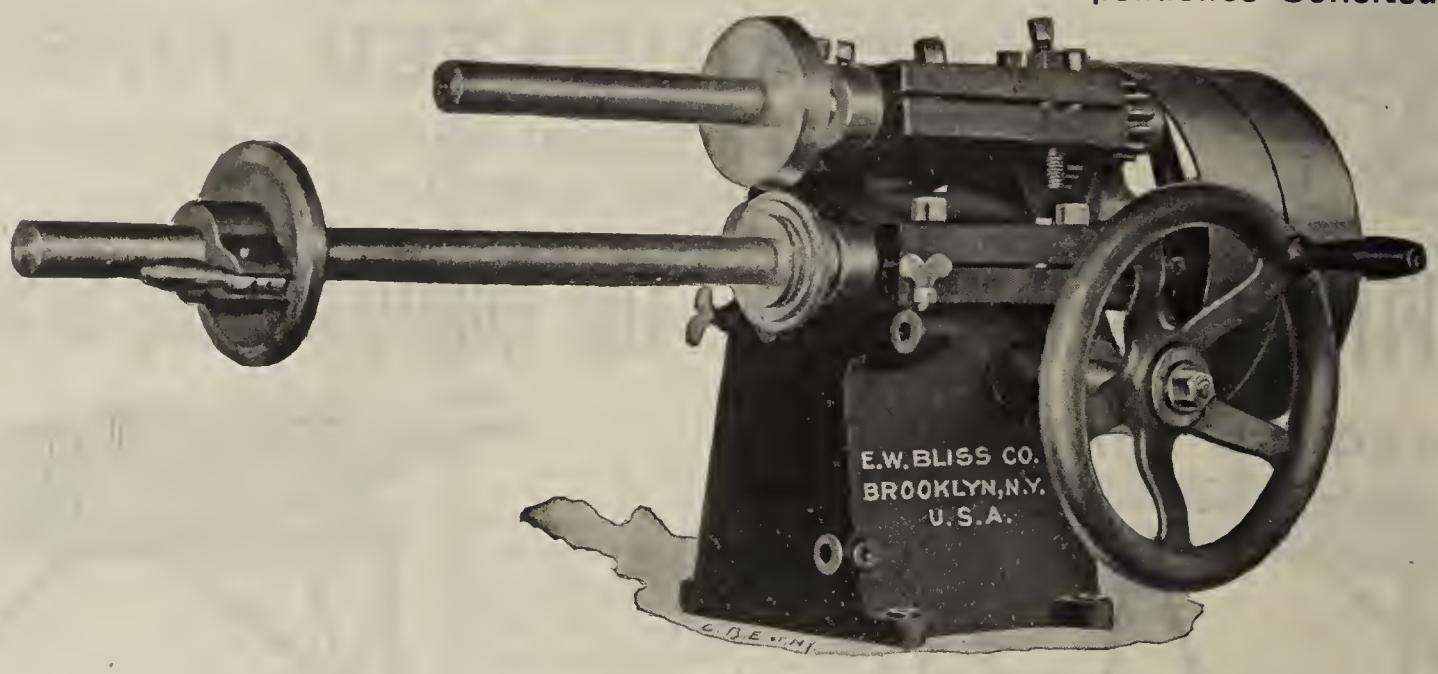
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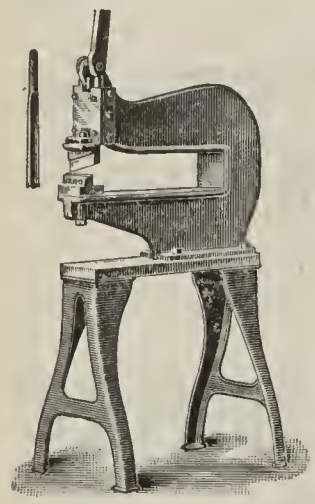
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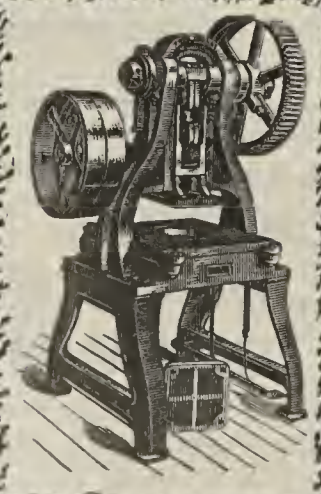
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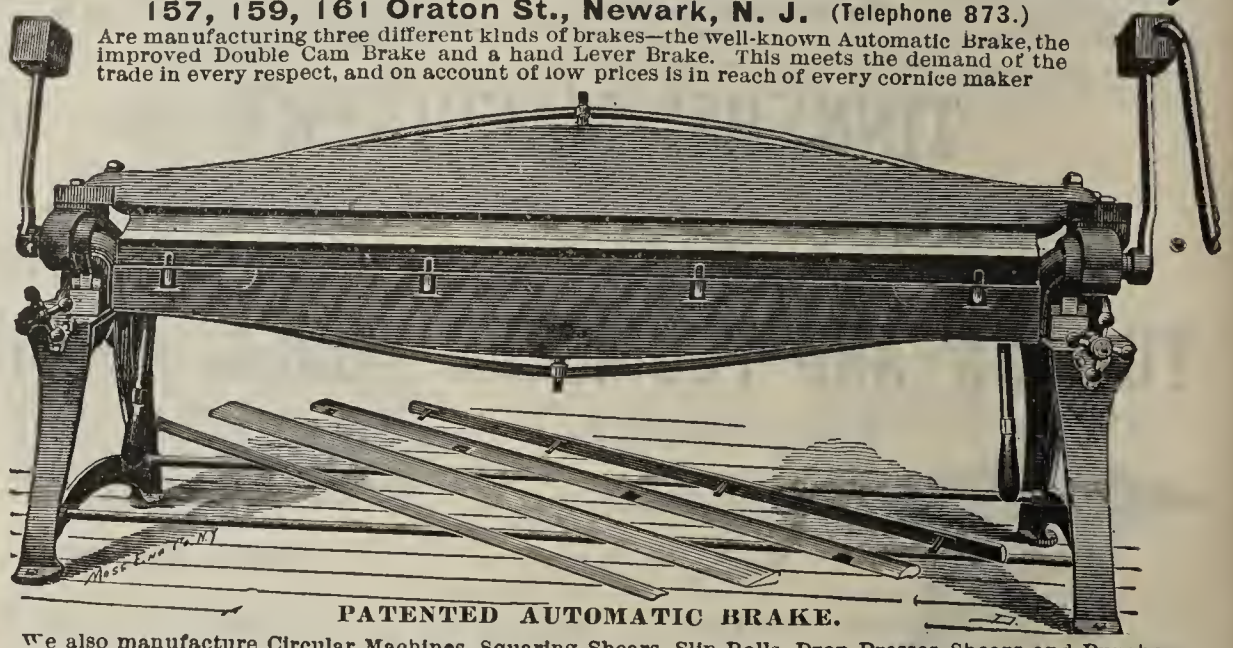
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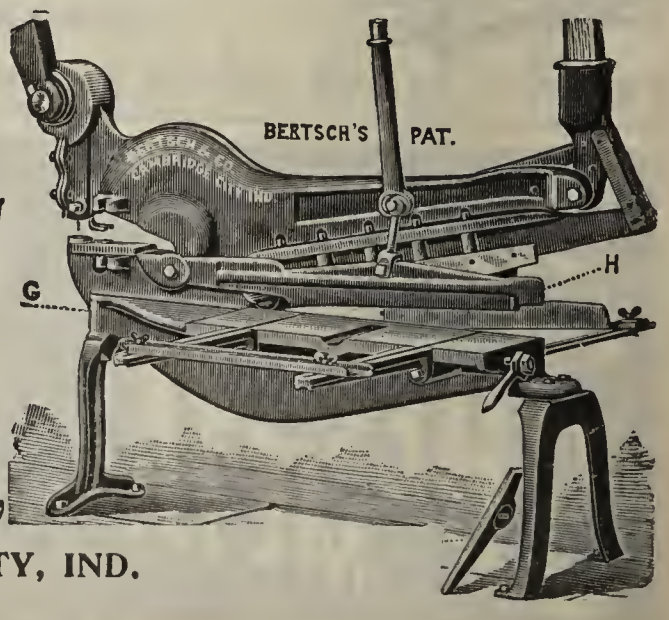
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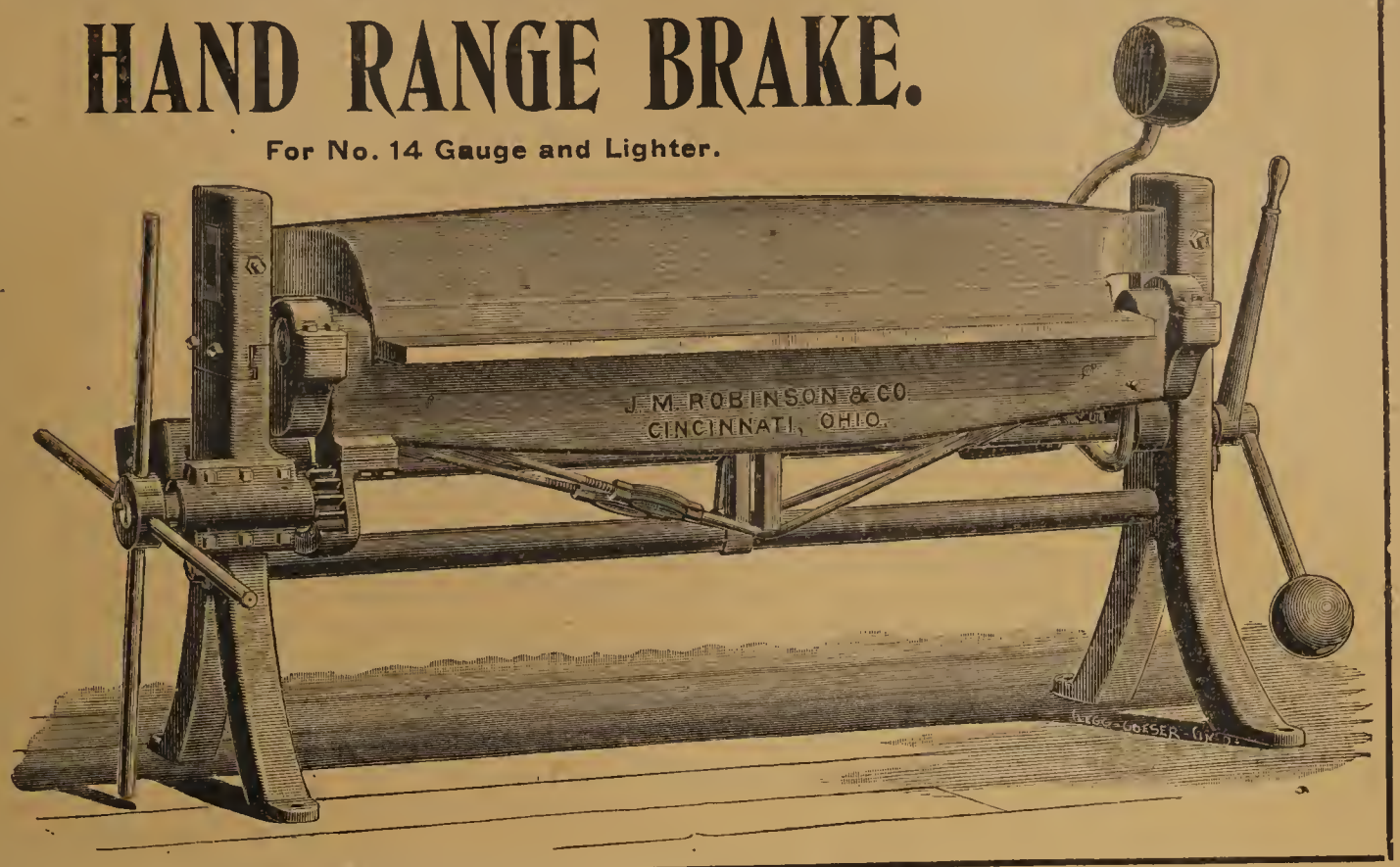
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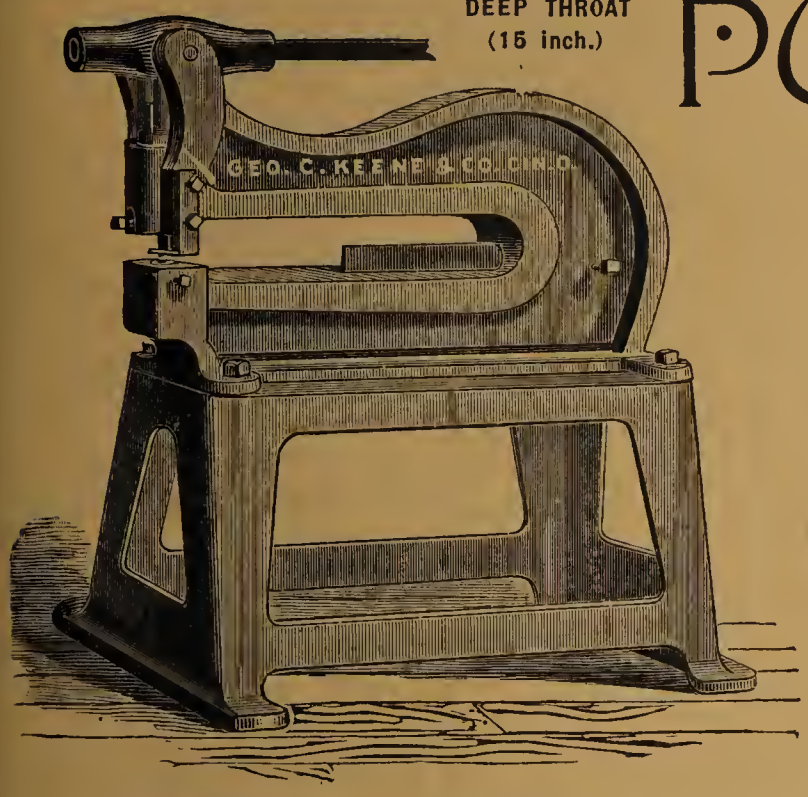
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SHEET METAL TOOLS ALL KINDS.

Presses, Dies, and Special Machinery.

ADRIANCE MACHINE WORKS, 169 Plymouth Street, Brooklyn, N. Y.

DEEP THROAT (15 inch.)



PUNCH.

Double Action.

Strong, easy of operation, cheap. Will punch ¼ inch hole through No. 10 iron or steel and lighter.

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—PROVIDING THEM PRACTICE.—Keedick—How wonderful are the ways of nature!

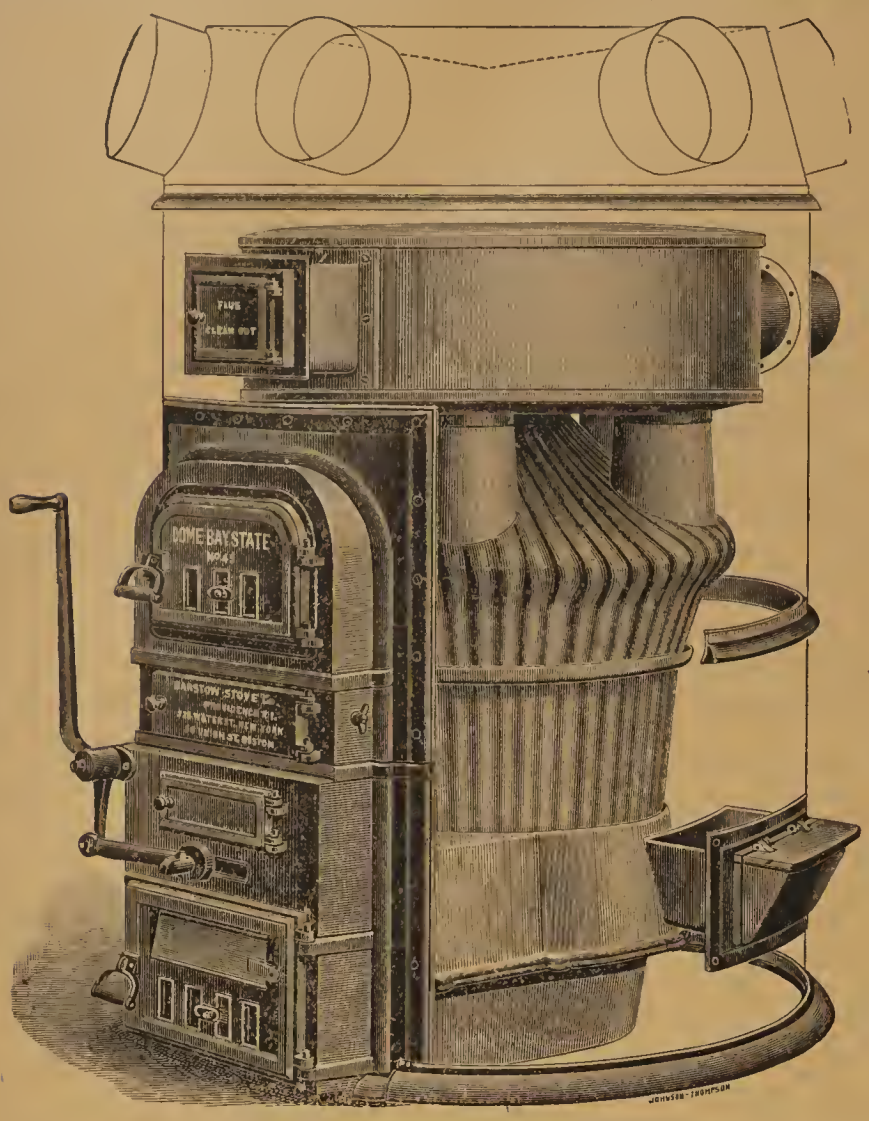
Fosdick—In what respect?

Keedick—It brings along the green-apple season just when the young doctors are being graduated.—*Judge.*

—Watts—Did you read about those Kansas hailstones that weighed a pound apiece?

Potts—Yes. But everybody knows what a little thing a pound of ice is.—*Indianapolis Journal.*

THE DOME
Bay State Furnace.



Six Sizes. 14 in. to 27 in. Firepots.

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The GREAT CHURCH LIGHT. Frink's Patent Reflectors for electric, gas or oil, give the most powerful, softest, cheapest and best light known for churches, halls and public buildings. Send size of room. Book of light and estimate free.

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"In one piece, with hook. Made f
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Sole Manufacturers of Woods Smooth Irons
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We Invite Attention
To our choice grades of

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SOLDER.

No solder is worth buying unless it is honestly made and guaranteed. We use no metal until it has passed through an additional process of refining and cleaning. SOLDER HAS ALWAYS BEEN A SPECIALTY WITH US. It is made by our own experienced men, in our own smelting rooms, and we give our personal attention to its manufacture. Only best selected metals are used, and THE PROPORTIONS HAVE ALWAYS BEEN GUARANTEED. . . . . .

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We have the following sizes in stock:

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Superior quality and finish. We invite correspondence before buyin

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Index to Advertisements, Pages 57 - 59.

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A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

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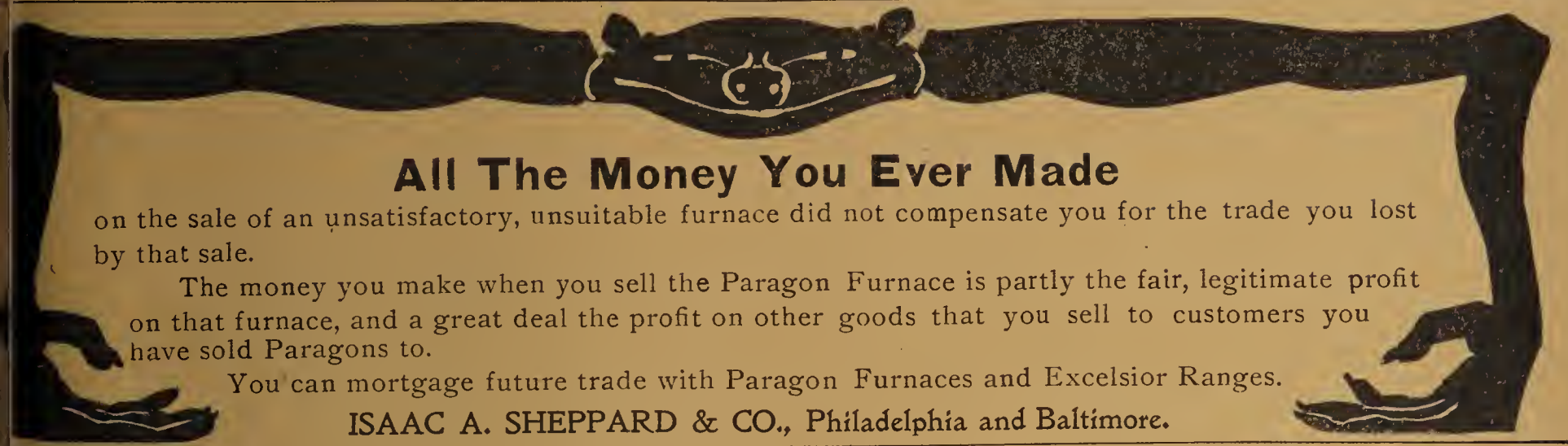
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on the sale of an unsatisfactory, unsuitable furnace did not compensate you for the trade you lost by that sale.

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We offer special lines of Lavatories, with Plain or Decorated Bowls, ranging in price from $10.00 or $12.00 to many times these sums, and we particularly desire correspondence with buyers who wish a serviceable and modern combination at a reasonable price. Inquiries for any description of Tinners' or Plumbers' Supplies will meet with careful consideration.

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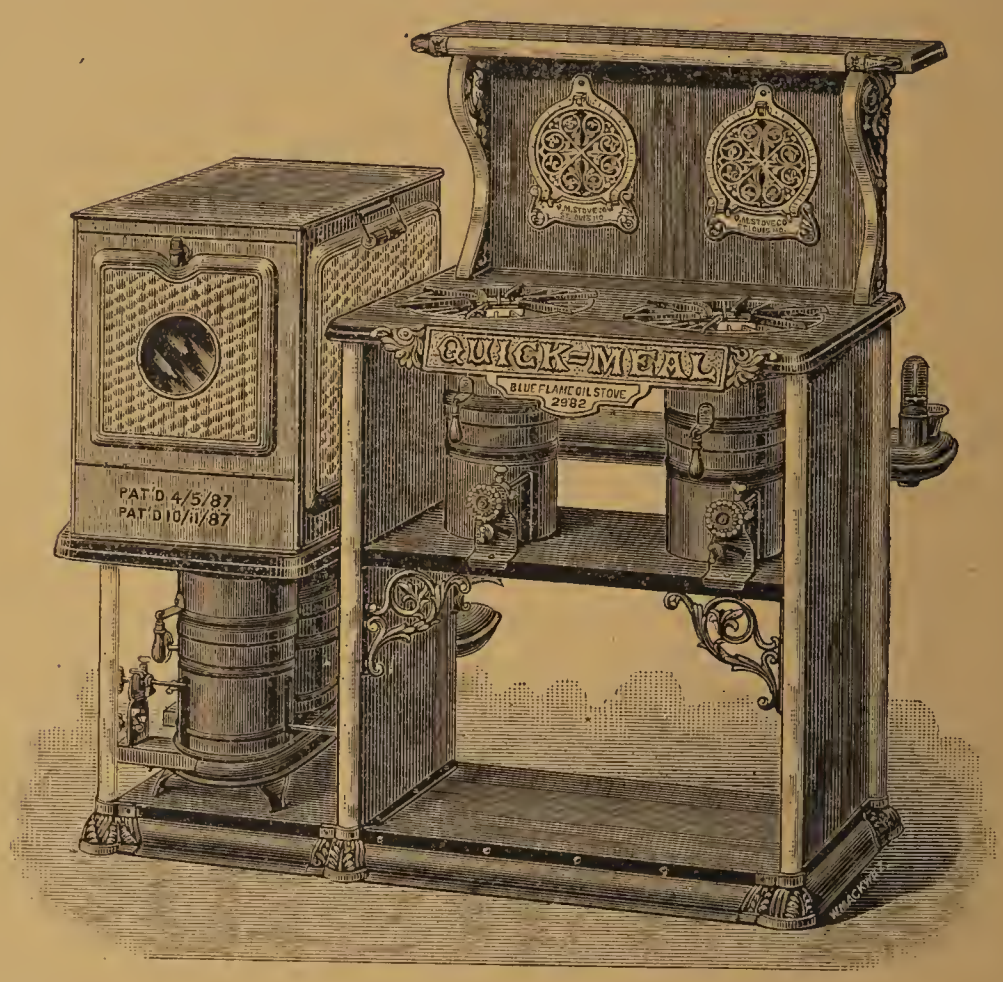
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Shows a complete line of cooking and heating apparatus.
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BLUE FLAME OIL STOVES.



The Quick Meal Blue Flame Oil Stove is the youngest member of the Quick Meal family, but it has become just as popular as the Quick Meal Gasoline Stove, the Quick Meal Gas Stove and the Quick Meal Steel Range. Please bear in mind that it has been greatly improved since last year and that it has embodied in it quite a number of points of merit not found in any other Blue Flame Stove—not the least of these being that the Tank is made of two pieces only, jointed with a single seam and leak-proof.

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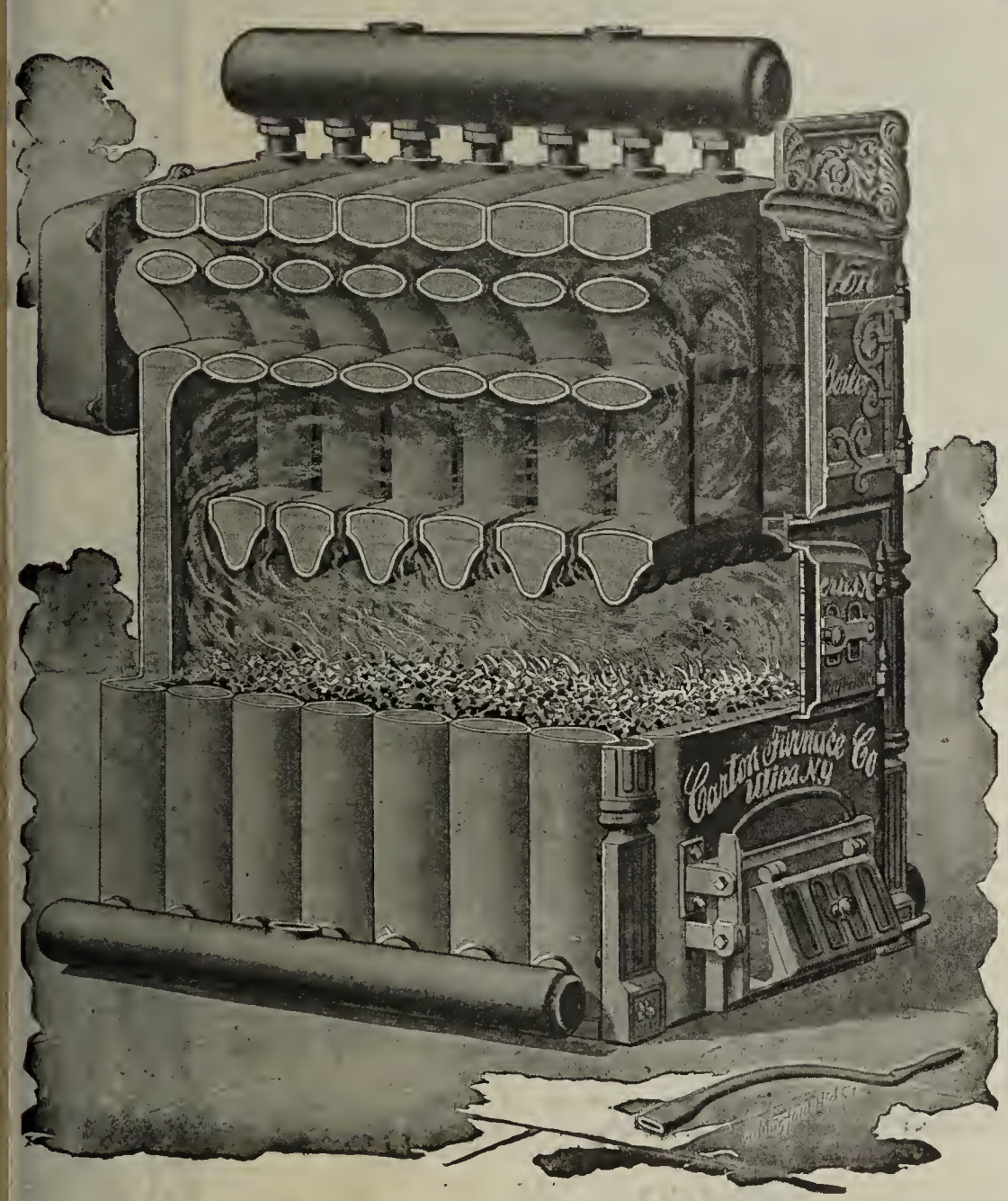
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BEST SATISFACTION

With the POOREST QUALITY of

SOFT COAL.

READ ! ! !



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DEAR SIRS:—We inclose our remittance and wish to express our thanks for getting such ***good boilers.***

The writer is using one of them and it is giving ***elegant satisfaction*** and don't think there is a better boiler made. We are using ***a very poor quality of soft coal*** and ***it works fine.***

Yours truly,
SCHILLING BROS.,
By E. H. SCHILLING.

Write for our Golden Jubilee Boiler Catalogue.

If Interested in Hot Air Furnaces—we make a most complete line—send for Furnace Catalogue.

CARTON FURNACE CO.,

Makers of Heating Apparatus for the past *51 Years,*

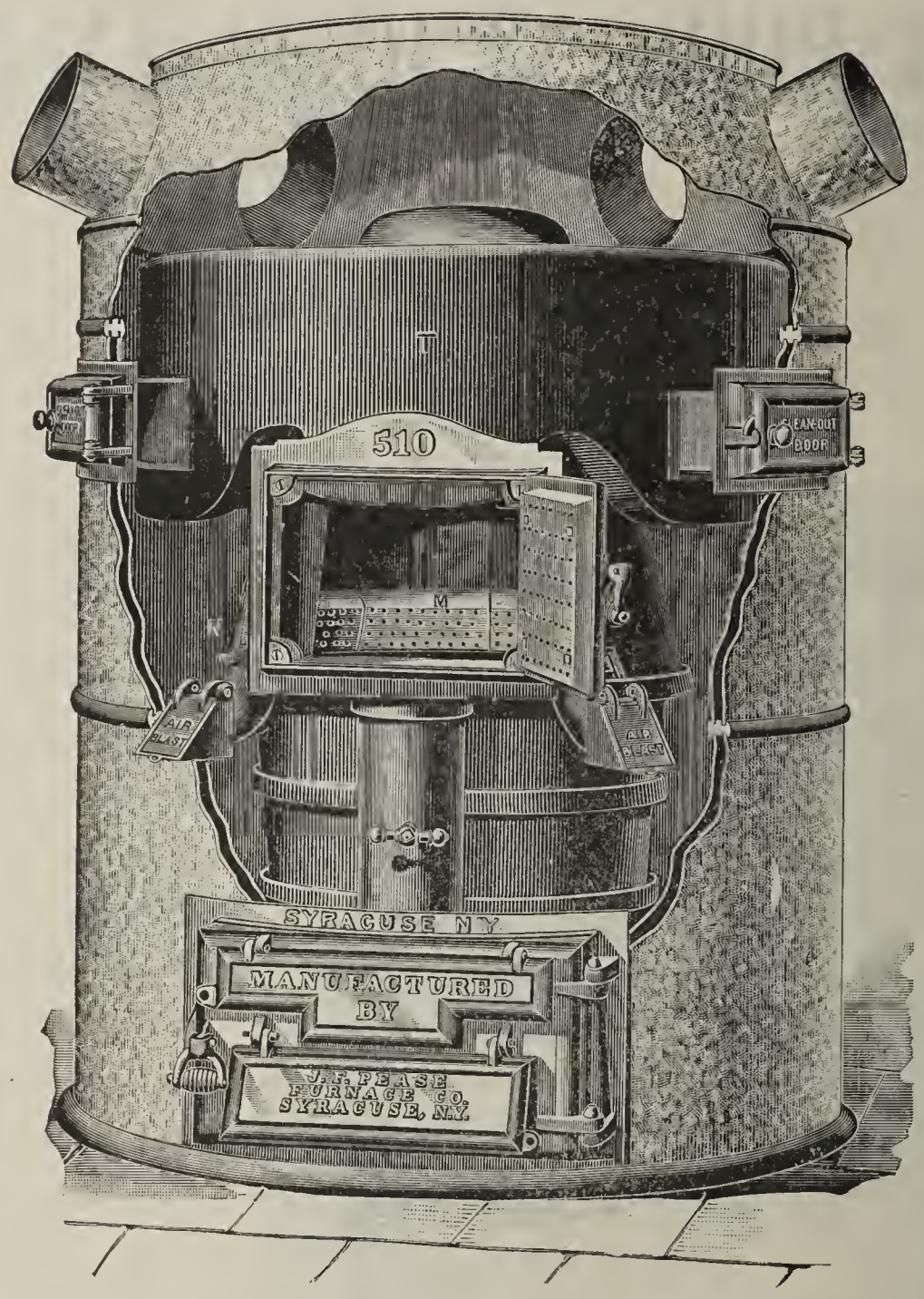
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Air Blast Furnace

SPECIAL SOFT COAL BURNER.



SPECIFICATIONS—All Cast Iron. Low in Stature. Not High Priced. Special Adjustable Air Blast Appliance. Nearly Jointless Construction. Selection from 3 Styles of Grate. COUNTERBALANCE SPRING REGULATOR.

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Wheeler
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PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
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We have heaters adapted to all sections of the country and for all kinds of fuel—Hard or Soft Coal, Coke or Natural Gas, etc.

Tell us your needs and we will do our best to fit you out.

Only recently a man in the West Indies wanted of us a furnace to burn dried cocoanut husks.

THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,
REAL ESTATE,
HATBORO, PA.

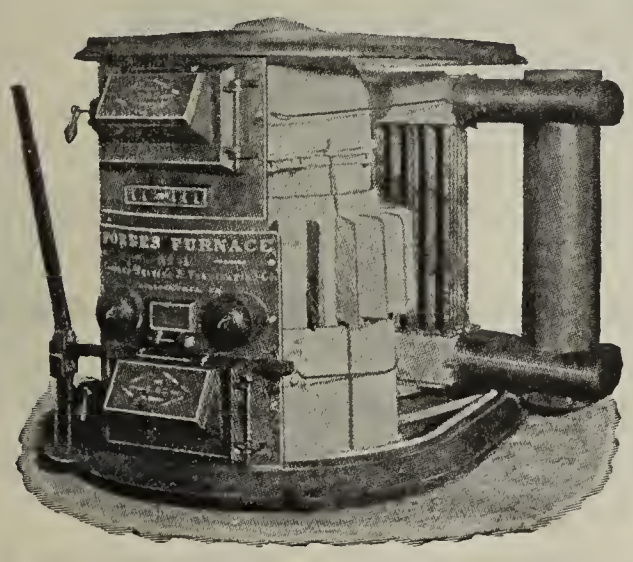
TUESDAY AND FRIDAY,
221 SOUTH FIFTH STREET,
PHILADELPHIA.

HATBORO, PA., Dec. 26th, 1896.

MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.
MY DEAR SIR :

In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal. Very truly, I. N. EVANS.

SEND FOR CATALOGUE



COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

Only 4 feet 3 inches high in the Largest Sizes.

. . . LOW PRICE . . .

TUBULAR HEATING AND VENTILATING COMPANY,

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DO NOT SPECULATE

IN

Cheap or Experimental

LINES OF

Vapor or Oil Cooking Stoves.



The average mortal has troubles enough of his own without buying those of his neighbor.

Speculation in any of the above mentioned lines will drain your purse and put you to a world of trouble.

Seeds of prudence now well sown in the selection of a line that is both complete and honest will yield a profitable and happy harvest. A good beginning for 1898 means half the battle won.

If you are interested in the handsomest line made, write for our catalogue.

EXCLUSIVE AGENCIES GIVEN.

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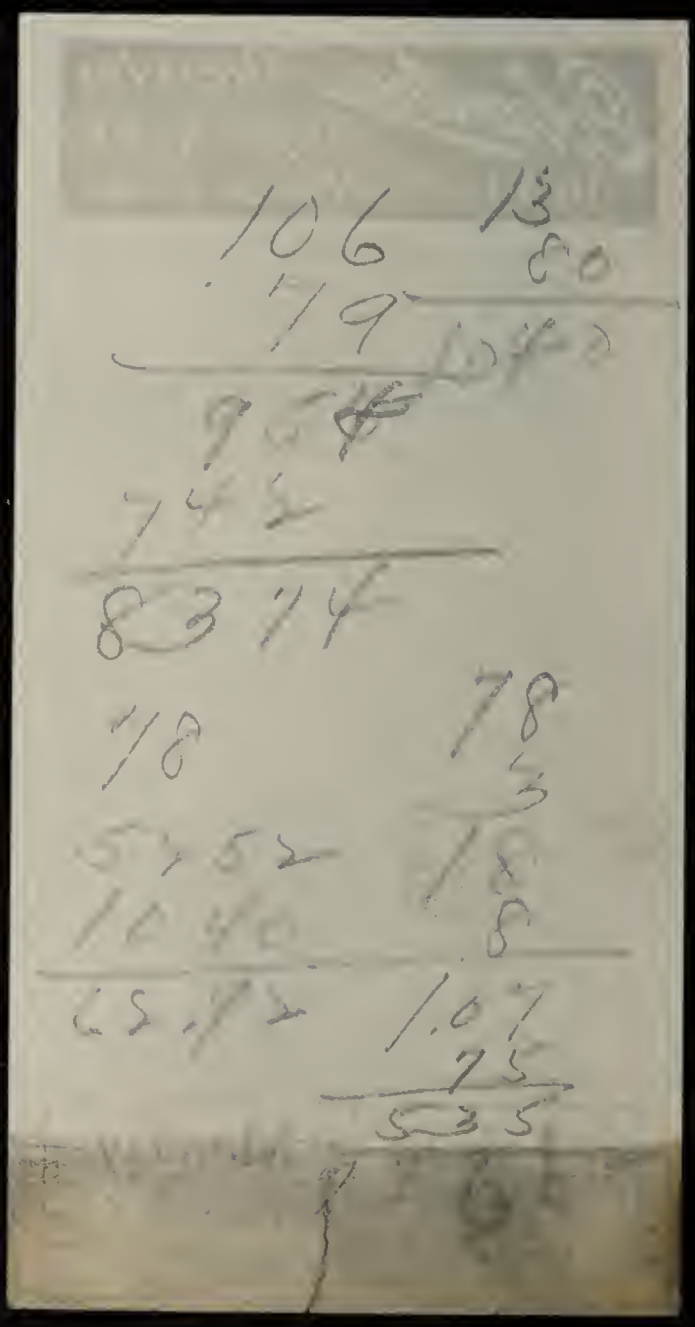
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Pope Mfg. Co.
1899 Hartford, Conn.

Would you mount each grade with ease,
Or speed on levels, if you please,
In perfect safety? Do you desire
To 'scape the ills of mud and mire?
Would you lead them all at coasting
In spite of all their noisy boasting?
Would you keep your clothing stainless?
Then, dear reader, ride the CHAINLESS.

Anonymous.

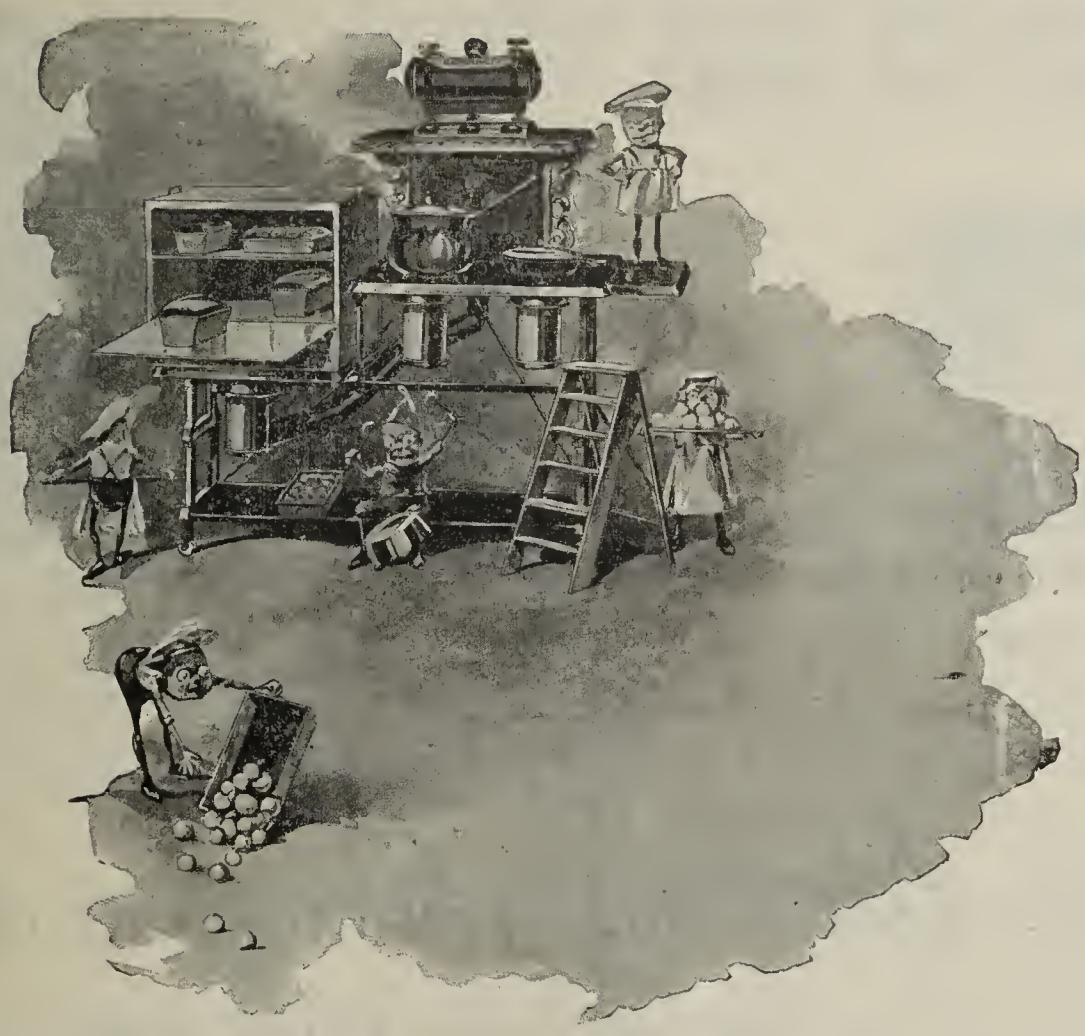
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"New Method,"
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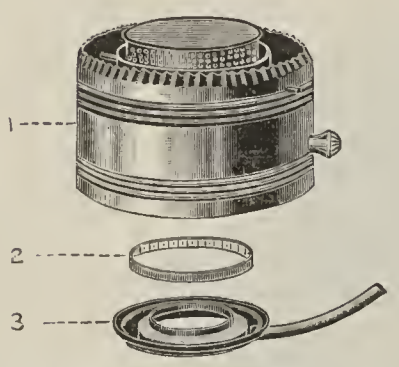
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BLUE FLAME OIL COOKING STOVE?

The SIMPLEST and Most Perfect in Operation.

BURNS COAL OIL (Kerosene) OR GASOLENE.

You can have the flame low and it WILL NOT CREEP.



Only 3 simple parts to the burner.



APPLY EARLY and secure the sale of the BEST.

Agencies are going fast.

We have jobbers at all distributing points for convenience in making prompt deliveries.

THE CLEVELAND FOUNDRY CO.,

CLEVELAND. BOSTON. SAN FRANCISCO, 132 Market Street.



Fast Growing Famous.

The Air Tight Round Oak Range!

A POT OF BEANS!

Read this from a user!

"We placed a crock of beans in the oven upon retiring at night—put in ONE stick of wood—and in the morning found the beans perfectly baked—and live coals enough to quickly start the fire."

BAKED POTATOES—*this from a dealer.*

"There never was a stove sold that I have known anything about—that was half as good in any of the following points: it will keep fire perfectly with one stick of wood all night:—bakes perfectly with two small sticks:—oven can be heated and bake potatoes for breakfast in 30 minutes—and in every way it is far superior to all others. I shall push them another season."

It is all in the painstaking fitting.

Do you like to sell the best?

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Estate of P. D. Beckwith, Dowagiac, Mich.

Makers of the Highest Class Stoves in America.

The Peerless Andes Range.

FROM MAINE TO CALIFORNIA

EVERY ONE IS TALKING ABOUT



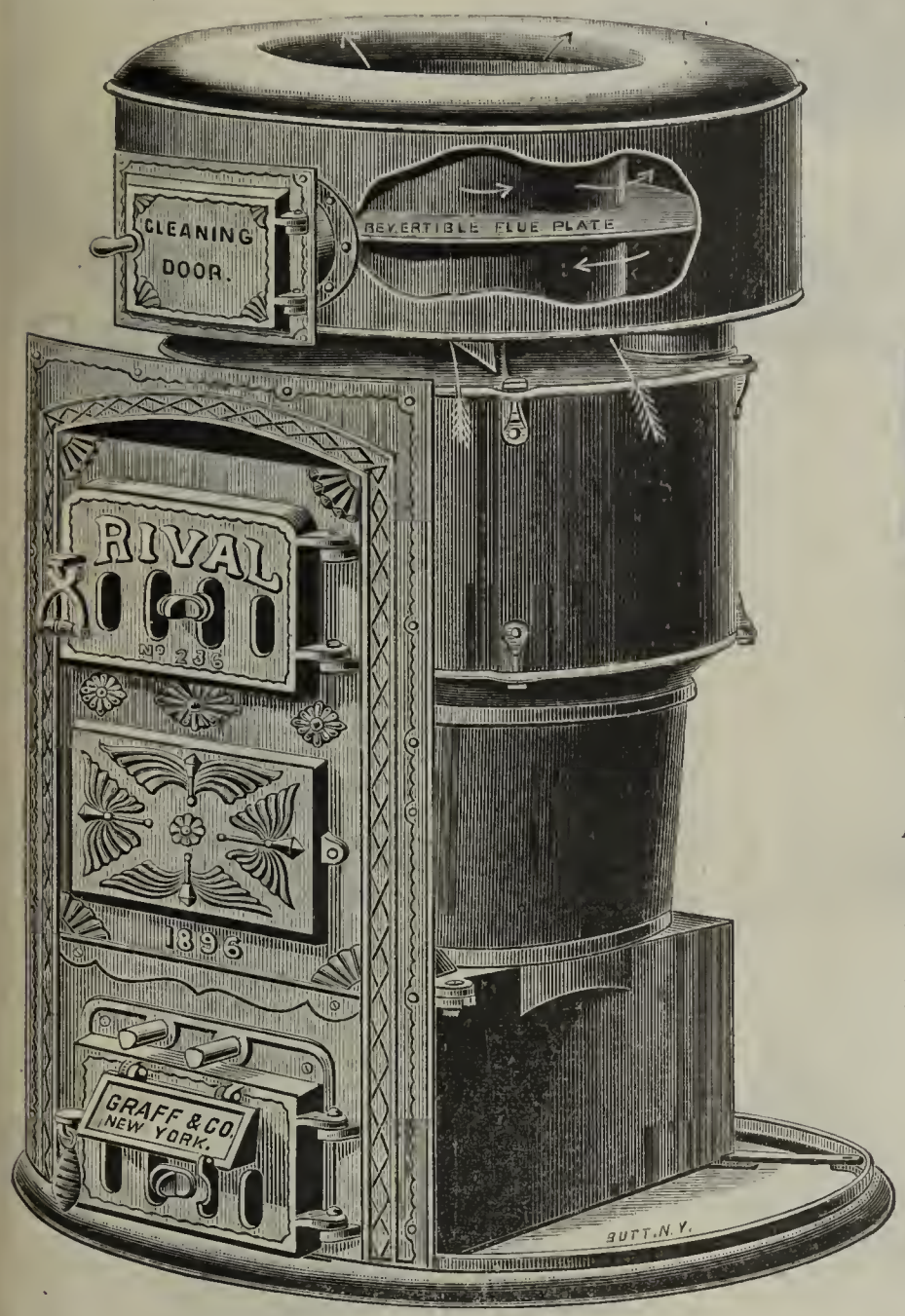
THE PEERLESS ANDES RANGE.

BECAUSE of its unequaled qualities for cooking.
BECAUSE of its peculiar and original construction.
BECAUSE of its fine finish and artistic design.
BECAUSE so many have been sold in so short time.
BECAUSE the people appreciate a good range when they see it.
BECAUSE the proper time to secure the agency is now.

ALL STYLES AND SIZES AND FOR ANY KIND OF FUEL.

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We Point With Pride

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Rival Furnace.

Because this construction secures ***as much radiating*** surface, ***and as great heating capacity,*** and ***is as easy to control and keep in order*** as any ***high-priced*** furnace. After two years' use many dealers say they never saw **a** furnace that could ***outheat*** it. We can give you ***more furnace*** at a ***low price*** than can be found elsewhere. ***Try*** and ***see!***

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PACIFIC RANGES

Are Best

BECAUSE

They're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

It is made with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal; is the latest, best and handsomest Steel Range ever offered, one that you can offer as simply "out of sight" compared with that sold by the peddlers. Try it.

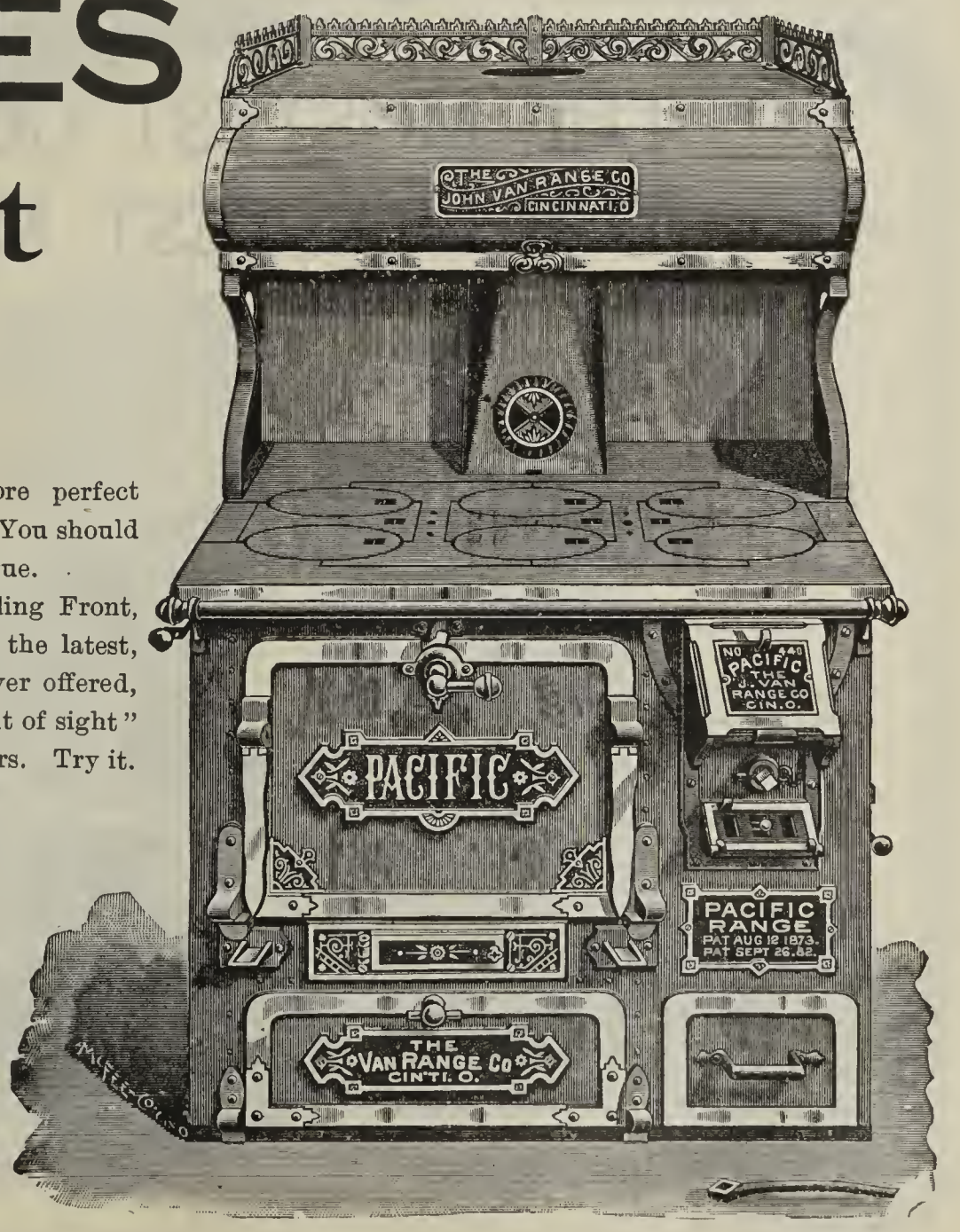
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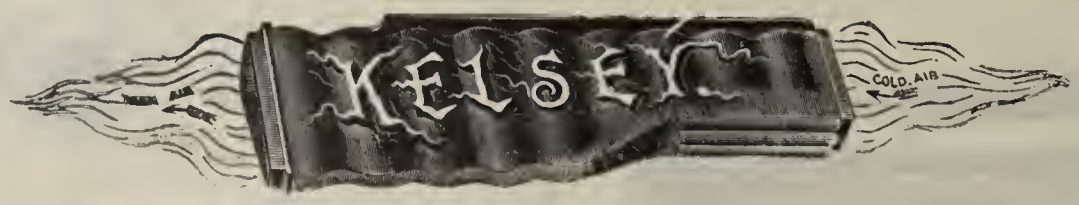
John Van Range Co.

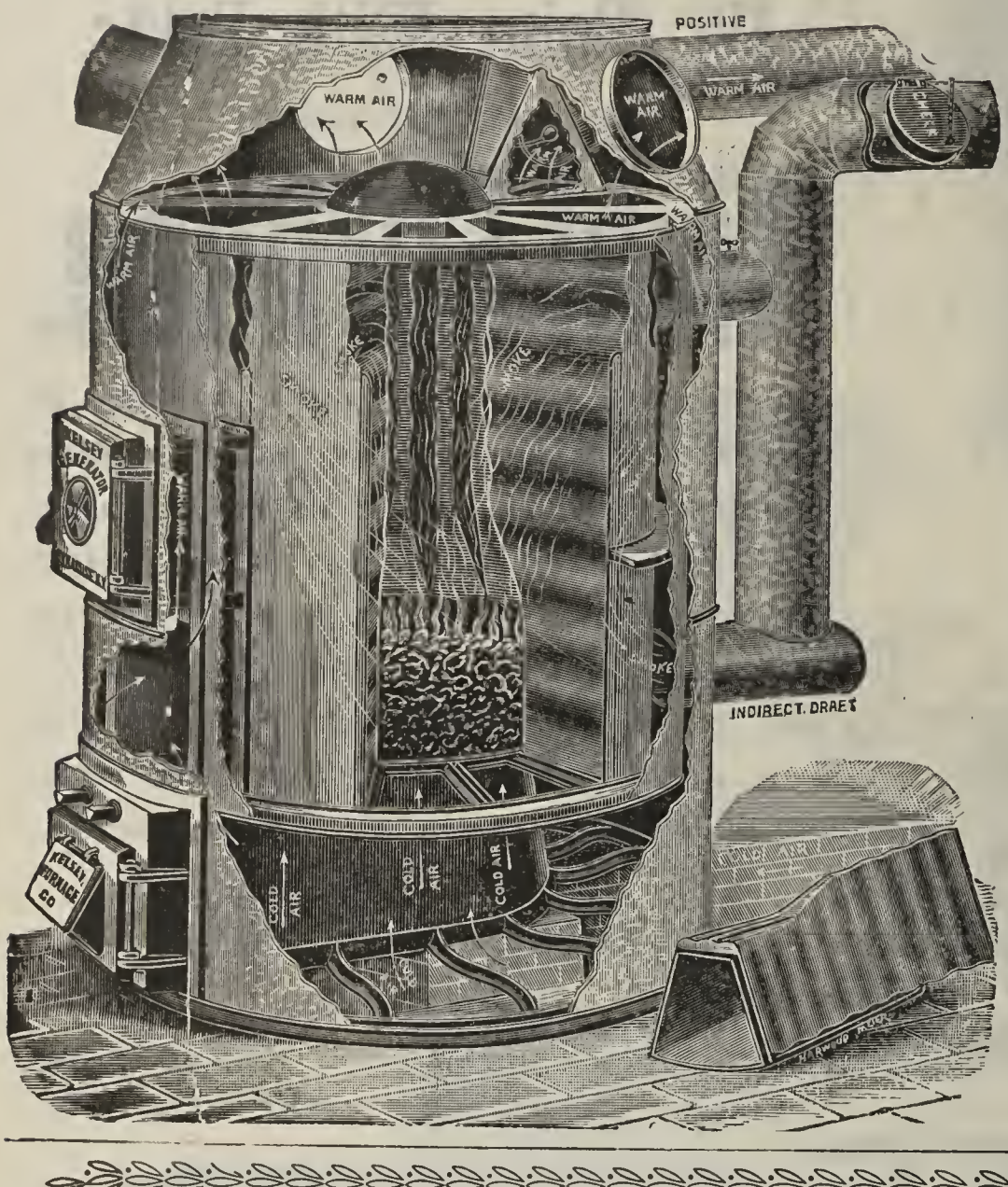
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Yours truly,
EDWARD KEATOR,
Pres't First National Bank.

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SYRACUSE, N. Y.

239 Water Street, New York City.
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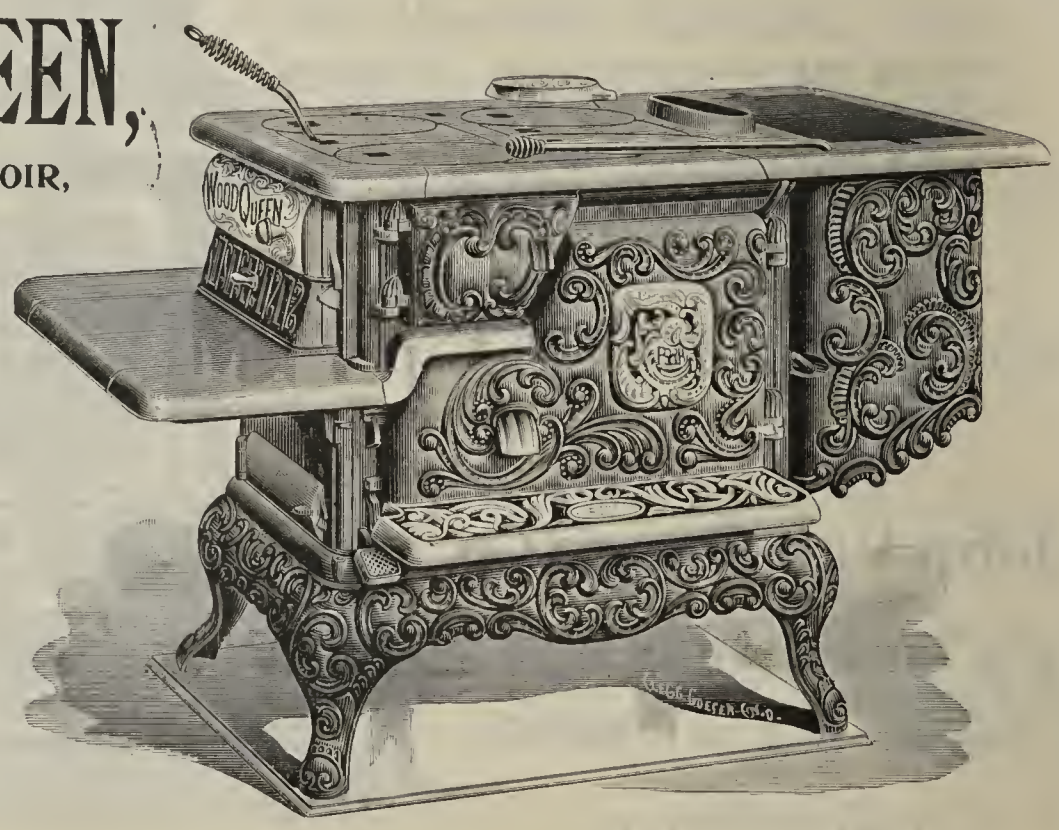
THE MOSTEST GOODS FOR THE LEASTEST MONEY. . .

The Stove is "all right" and we can prove it to you by sending you a sample. It is ***"Lansing"*** the trade of our contemporaries and orders are pouring into the ***"Grand Haven,"*** where we take care of them promptly.

THE WOOD QUEEN,

WITH BRACKET RESERVOIR,

is a great big well made wood stove that is beautiful in design and modern in every respect. We have the first time to place a sample that has not brought in a nice order. Send for prices and secure the agency for your town.



The Portsmouth Stove & Range Co.,

Busiest makers of Stoves and Ranges in the world,

Portsmouth, Ohio.



Kernan

400th Series.

New Line

Just Out

FIVE SIZES.

Casings,

32, 36, 40, 44 and 48 inches.

Fire Pots,

20, 22, 24, 26 and 28 inches.

Constructed Especially for City Contracts.

LOW DOWN POWERFUL **HEATERS**

Cast or Steel Radiator.

Write for Catalogue and Discounts.
Secure the Agency now.

KERNAN FURNACE CO.,

UTICA, - N. Y.

EASTERN OFFICE:

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NEW YORK CITY.



THE THERMOSTAT,
A SENSITIVE PLATE.



TO HEATER DRAFTS OVER PULLEYS.

HOWARD

Automatic
DRAFT REGULATOR
Consists of a
Plate, Damper and Pulleys.

The *DAMPER* is operated uniformly with the changes in temperature and not opened and closed suddenly. The movement and power is obtained directly from the *PLATE*. From a normal position to wide open or closed, the change is but

ONE DEGREE.

PRICE IS POPULAR.
GET POSTED.

HOWARD

Regulates
Furnaces and Boilers.

YOU should use it. *WHY?* It saves labor and worry about heater; gives nice heat; prevents danger from overheat, and

SAVES COAL.

MADE BY
HOWARD THERMOSTAT CO.,
OSWEGO, N. Y.

1/4 Off
LABOR,
WORRY,
BAD HEAT,
DANGER,
COAL.



EMPEROR FURNACES

FOR WOOD.

Simple, Safe Durable.

ECONOMICAL IN FUEL.

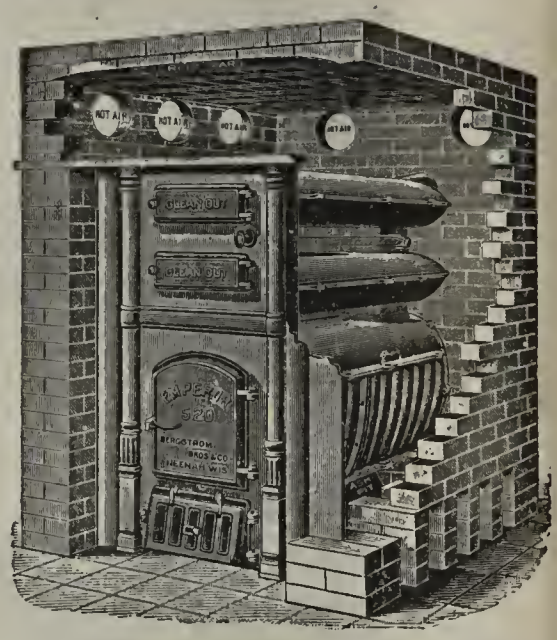
The Best and Cheapest Line of Wood Furnaces.

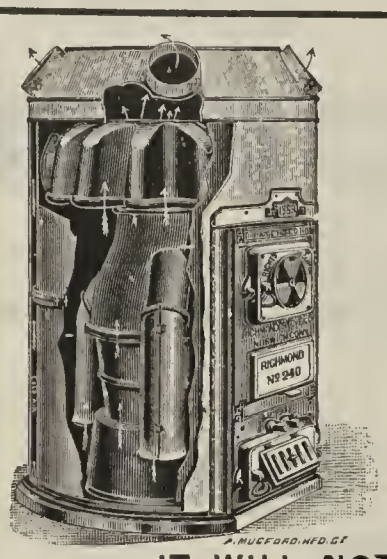
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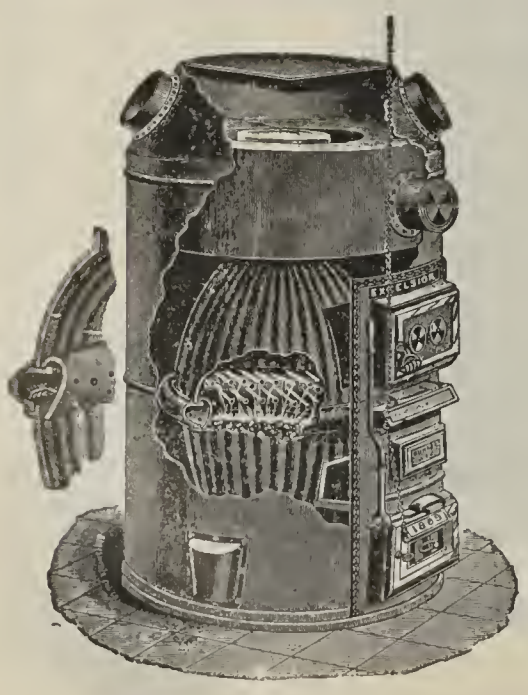
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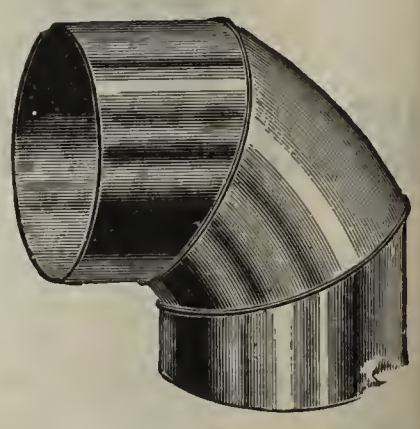
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See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

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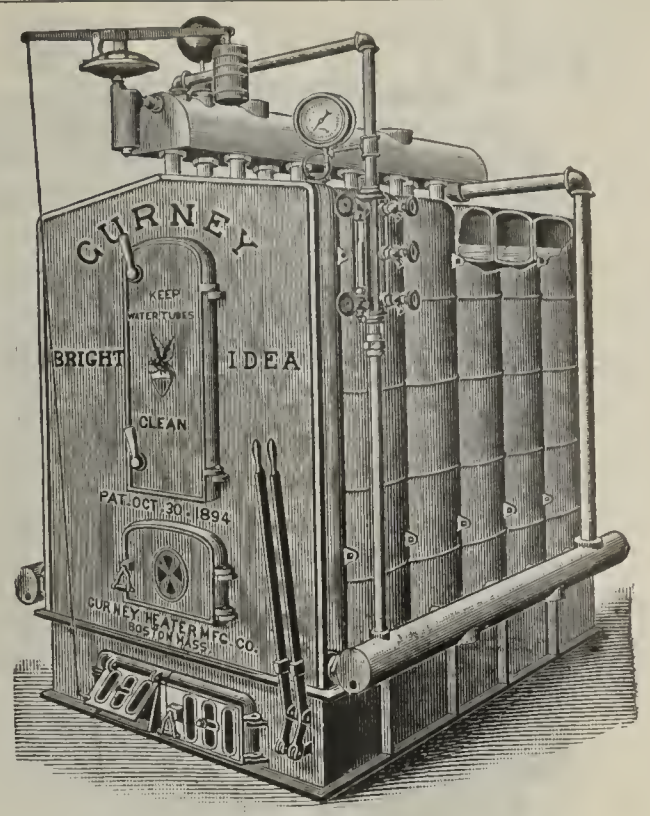
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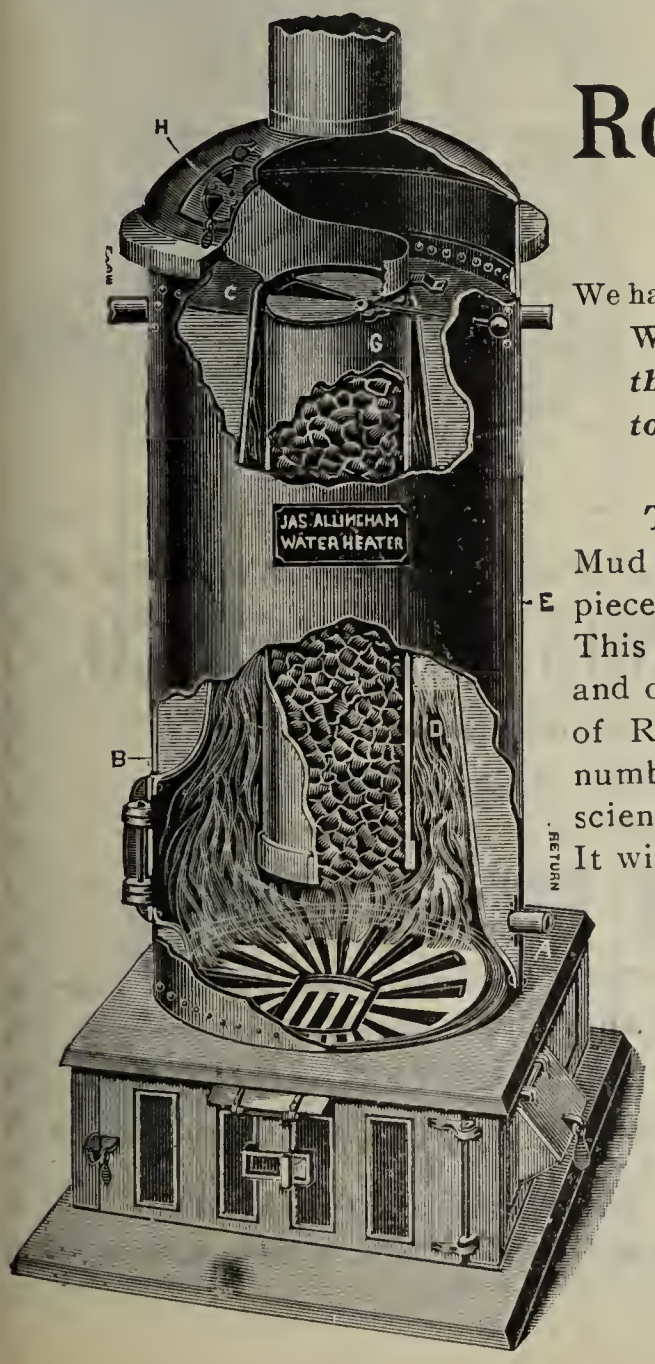
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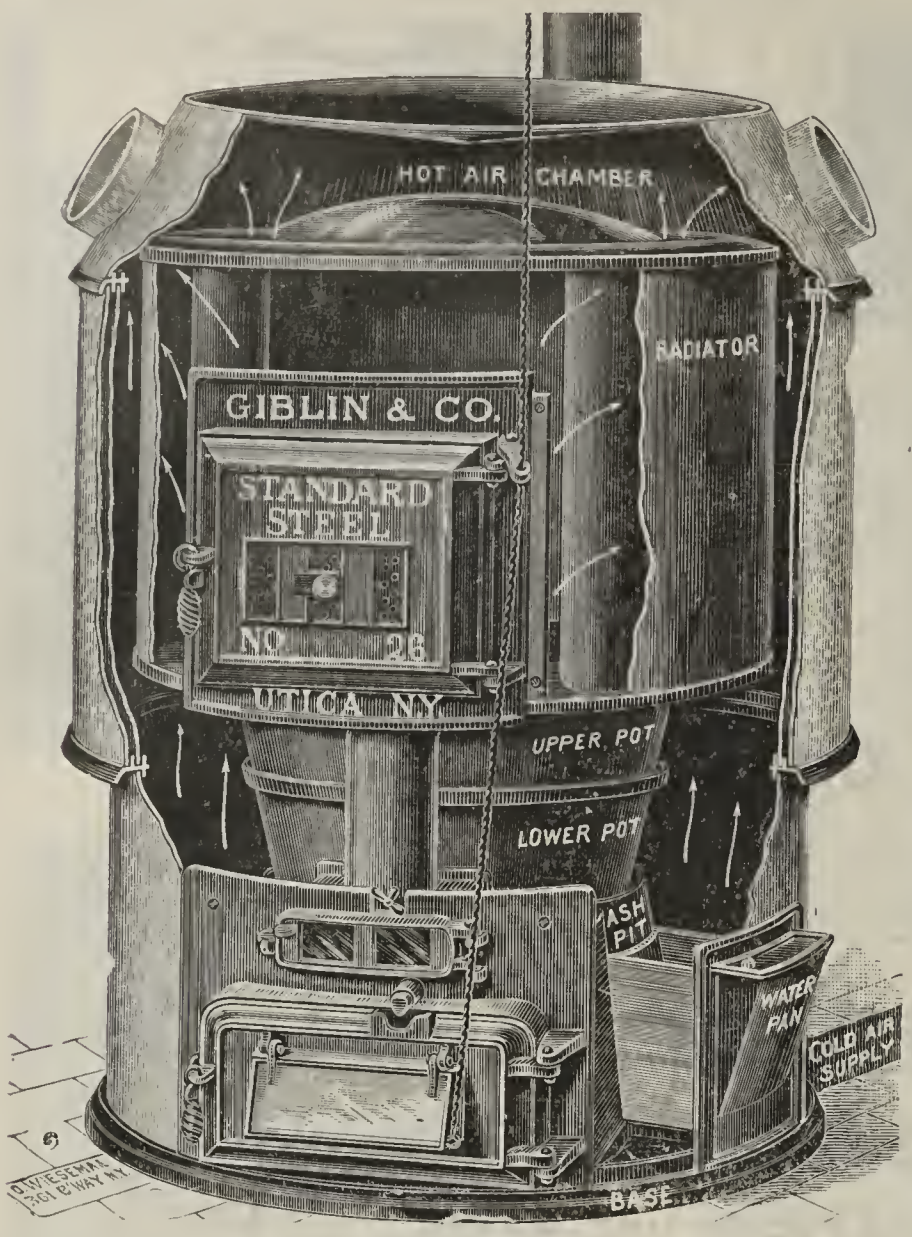
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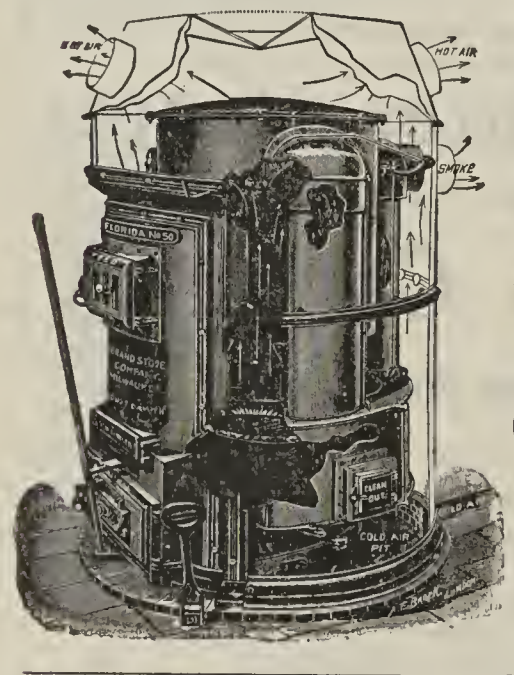
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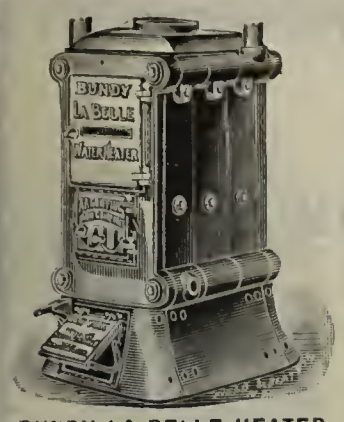
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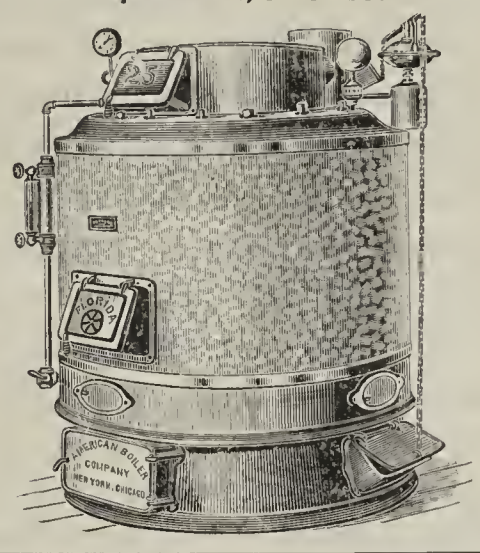
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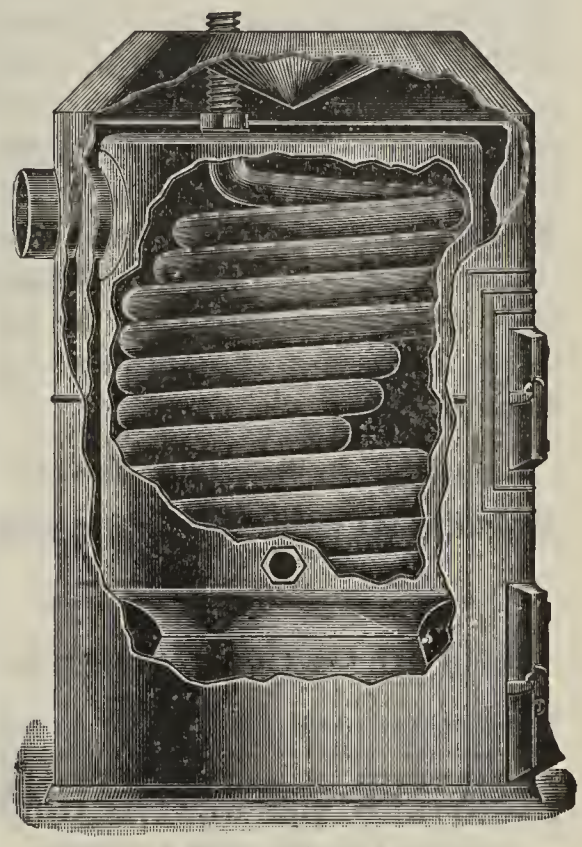
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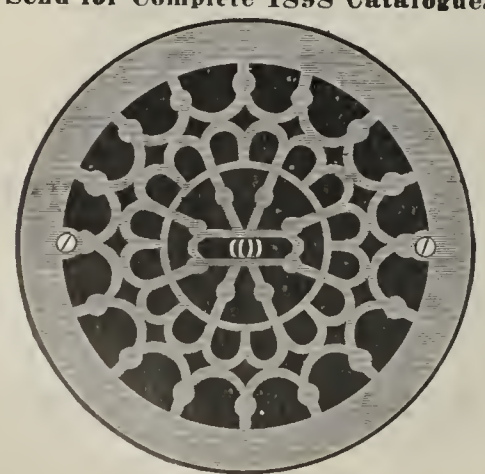
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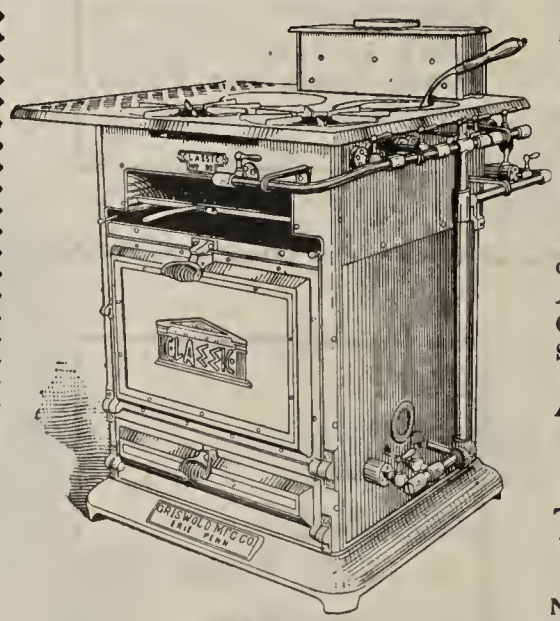
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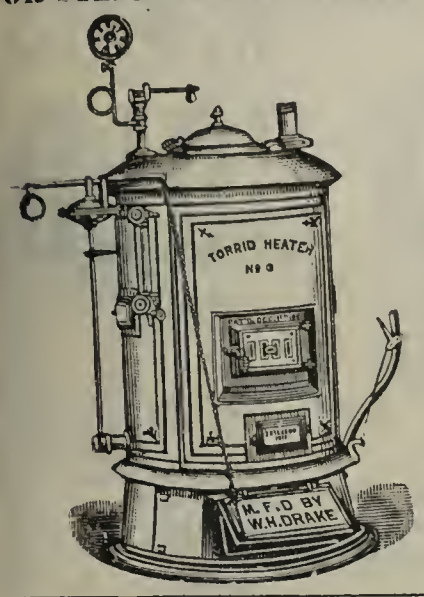
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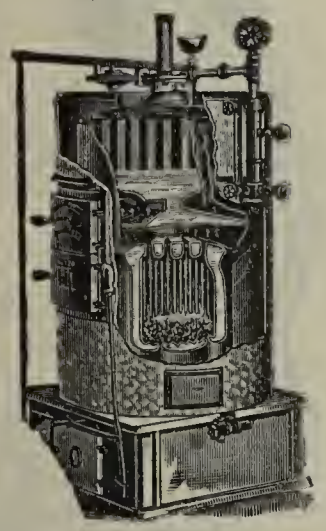
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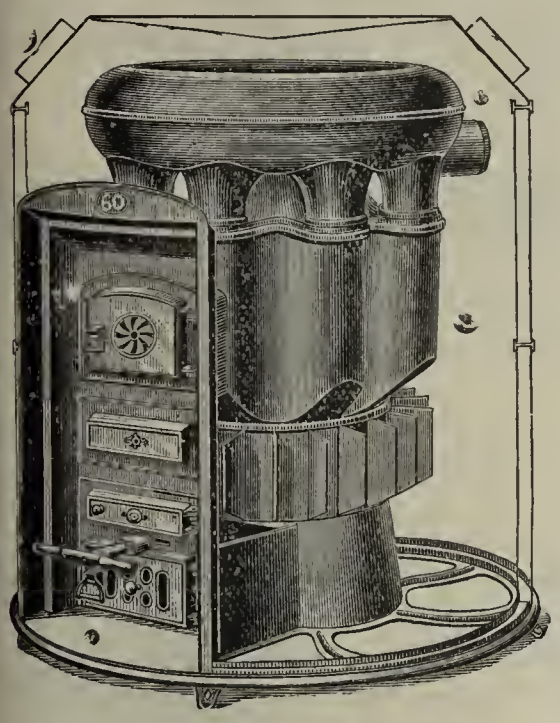
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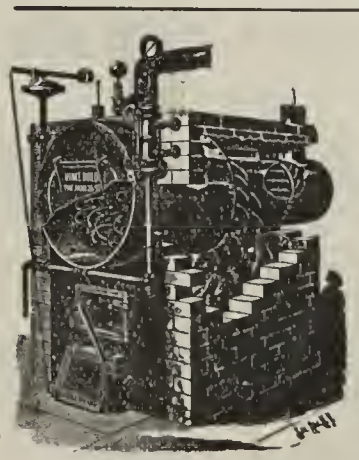
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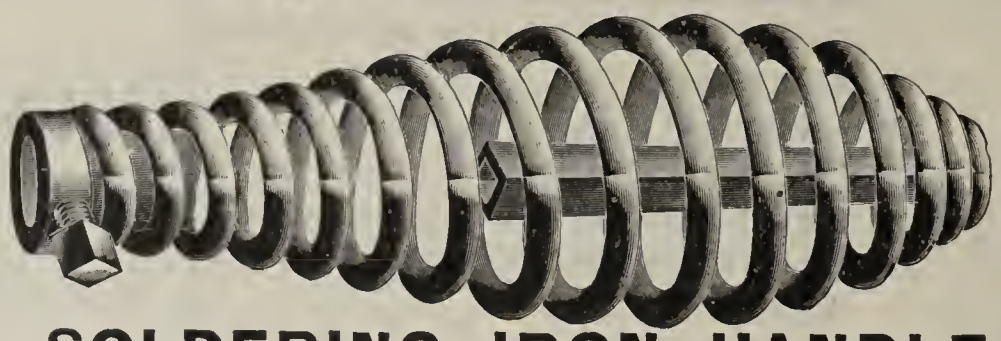
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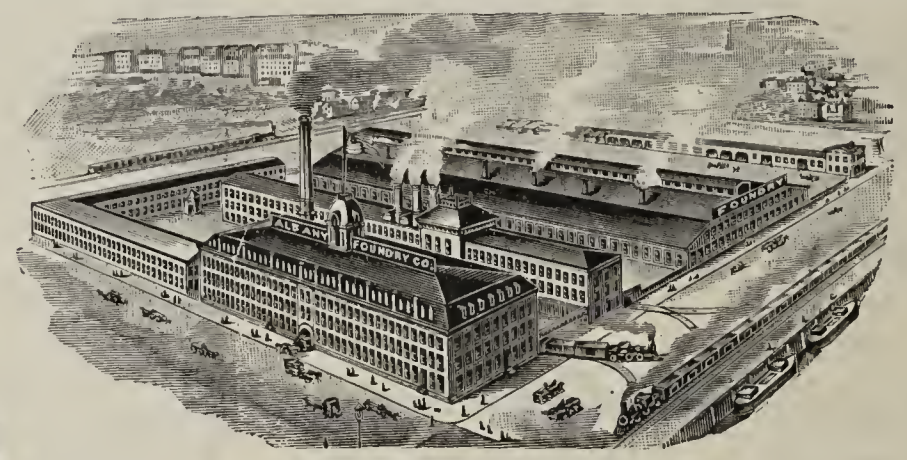
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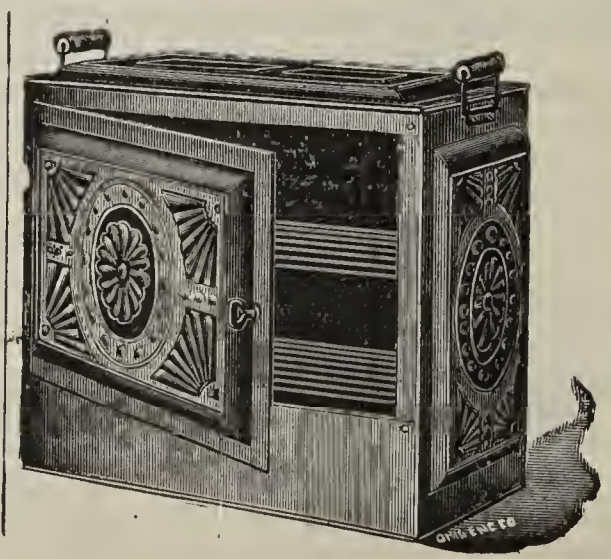
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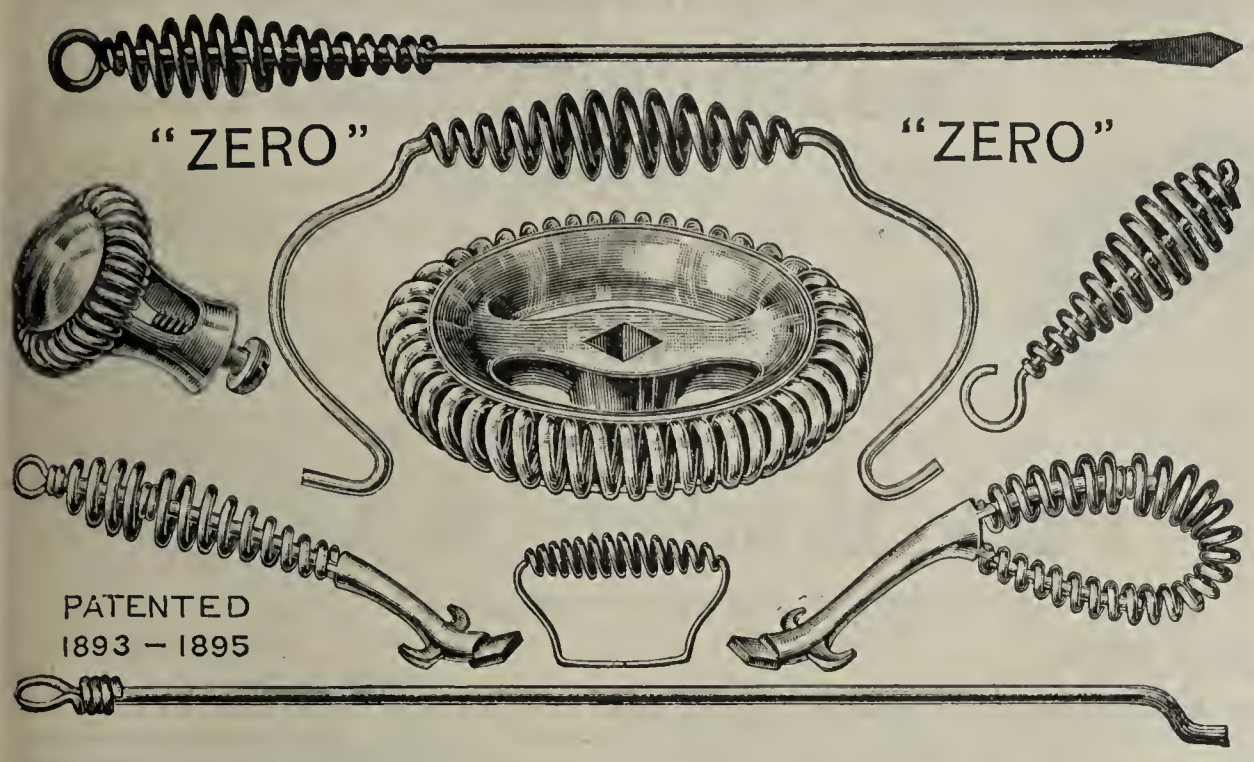
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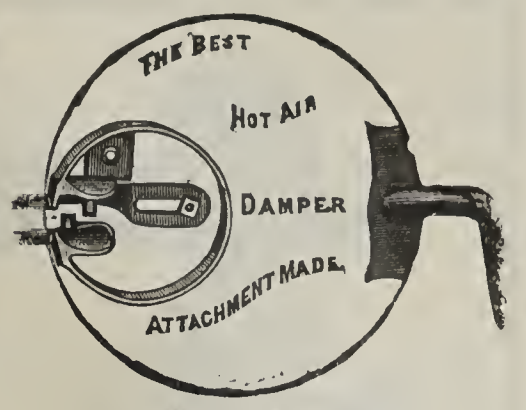
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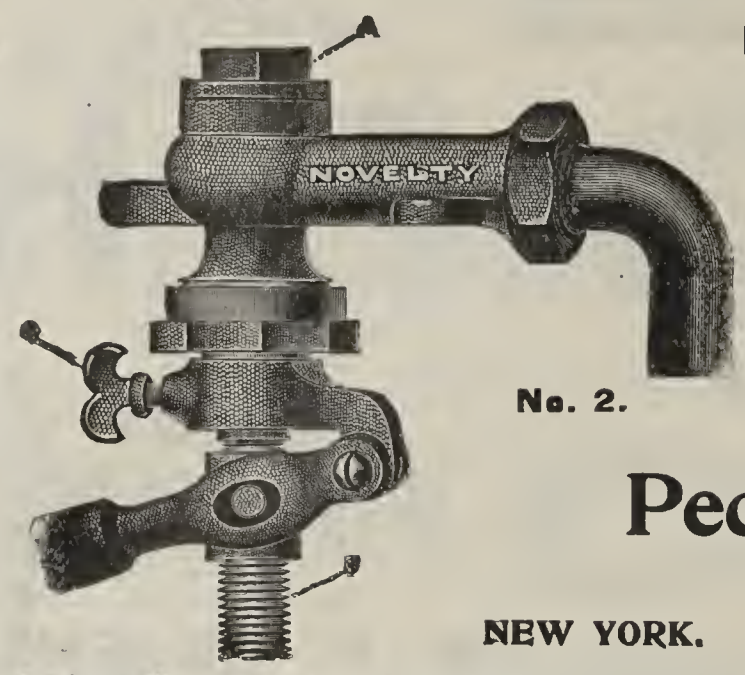
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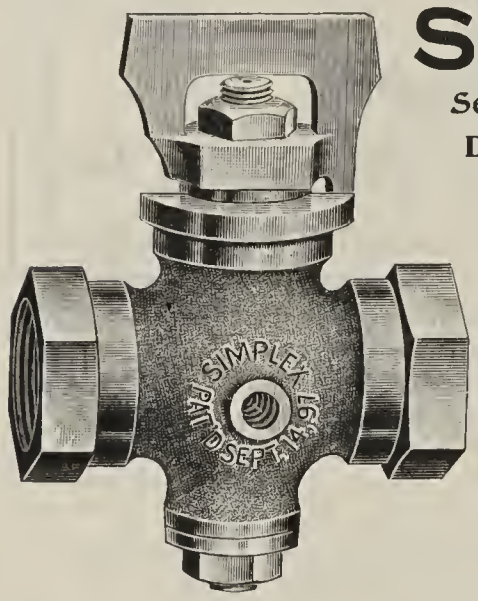
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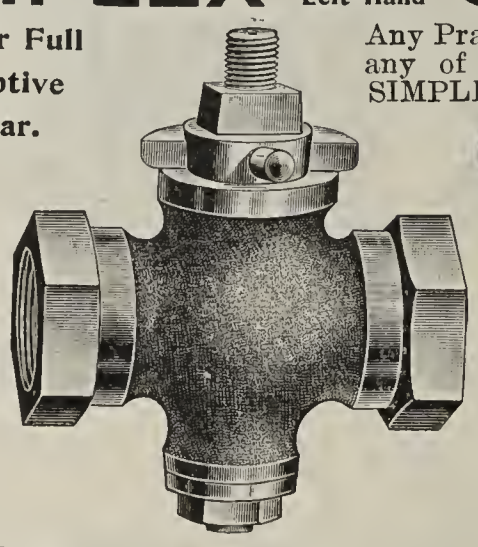
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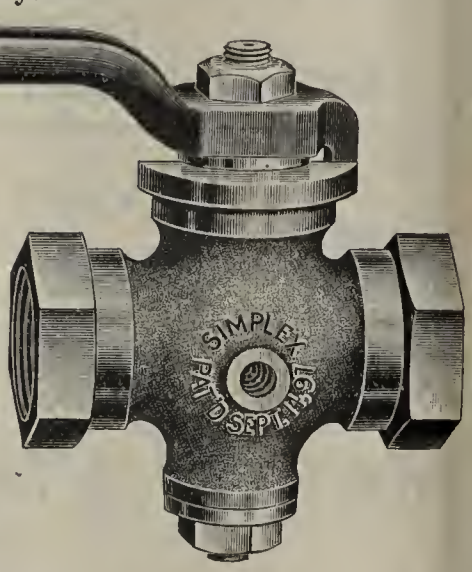
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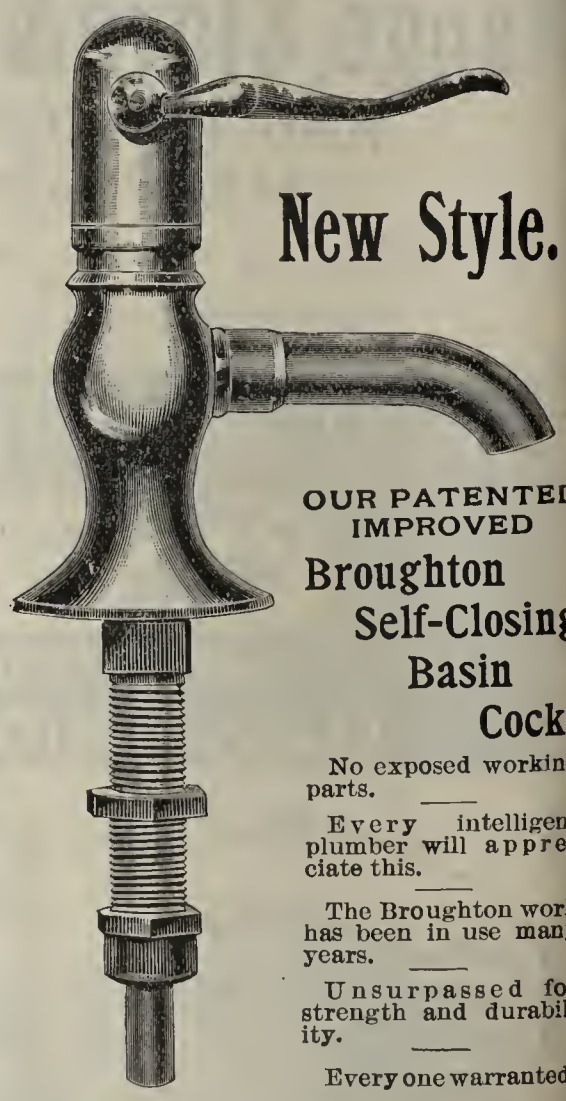
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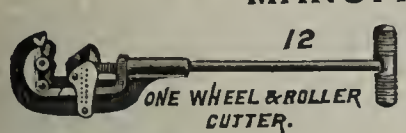
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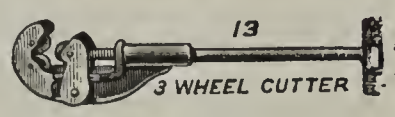
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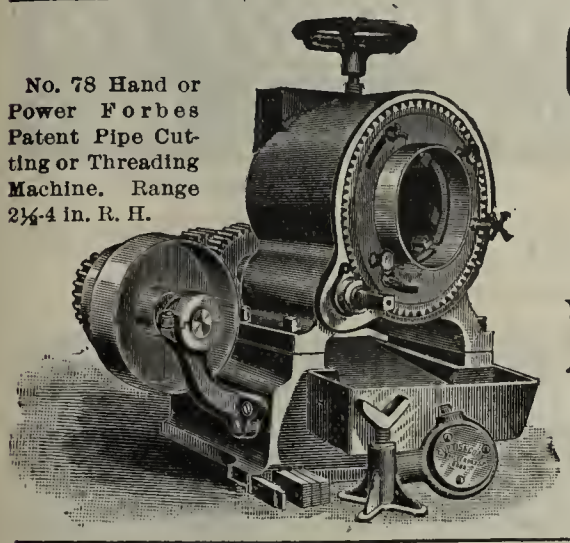
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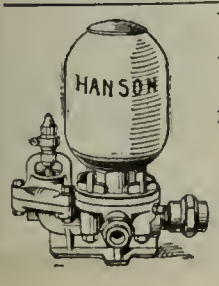
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The Distillation or Manufacture of Coal Gas,
The Distribution of Gas from the Gas Holder Through the Town,
Connecting the Meter in Buildings,
Inspection of Material and Work,
Laying Out Pipe,
Gas Fitters' Tools,
Piping the Building,
Measuring Pipes,
Cutting the Pipe,
Finding Leaks,
Putting Up Fixtures,
Gas Logs,
Economical Gas Burning.

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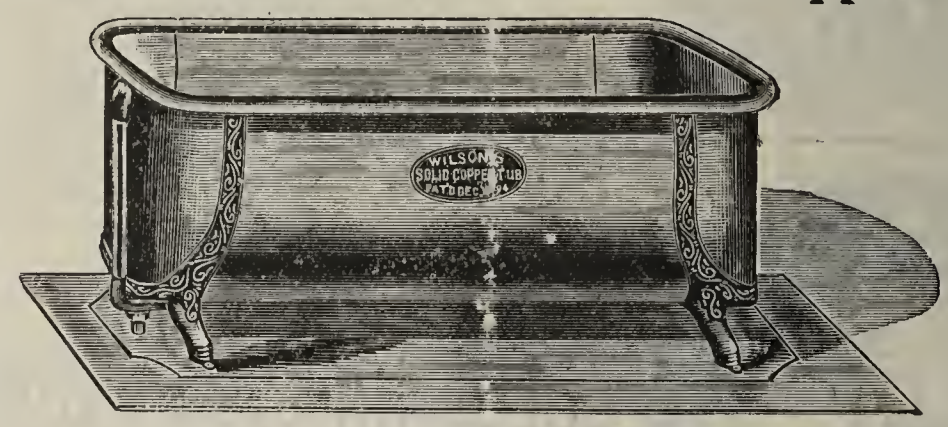
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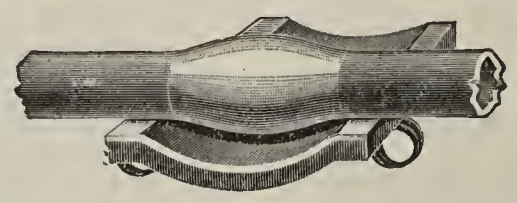
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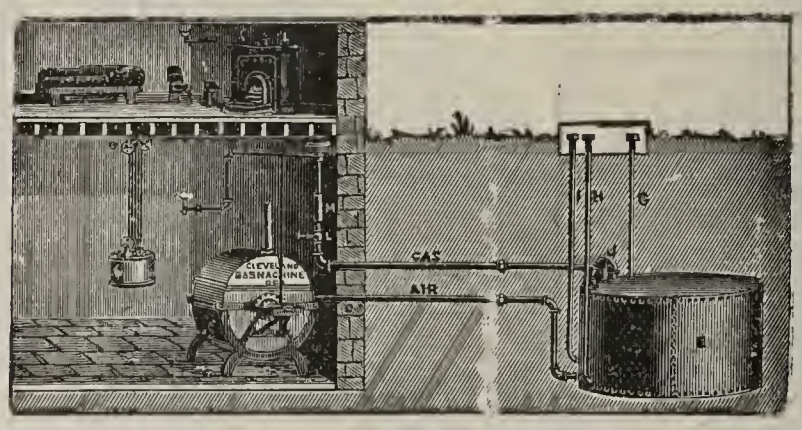
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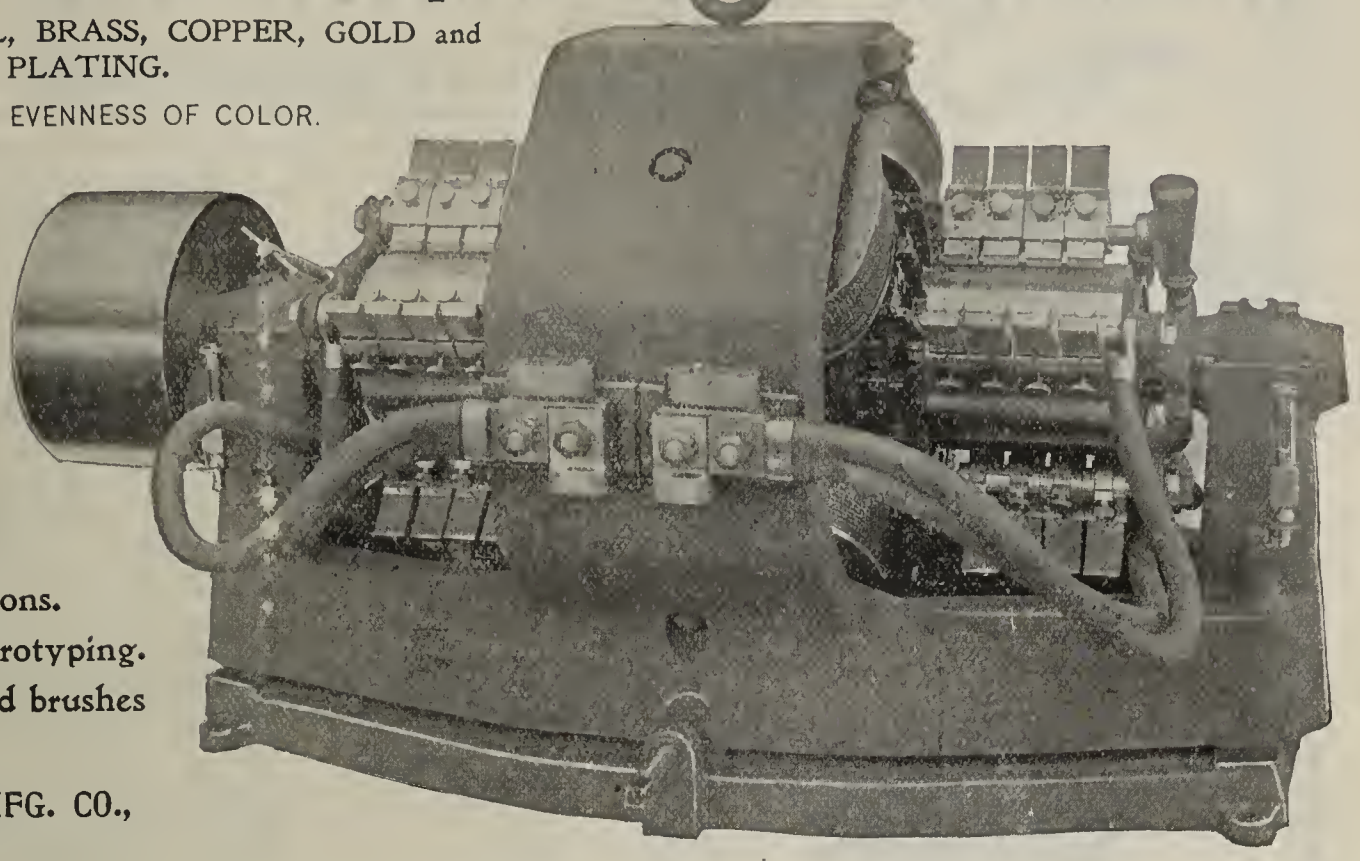
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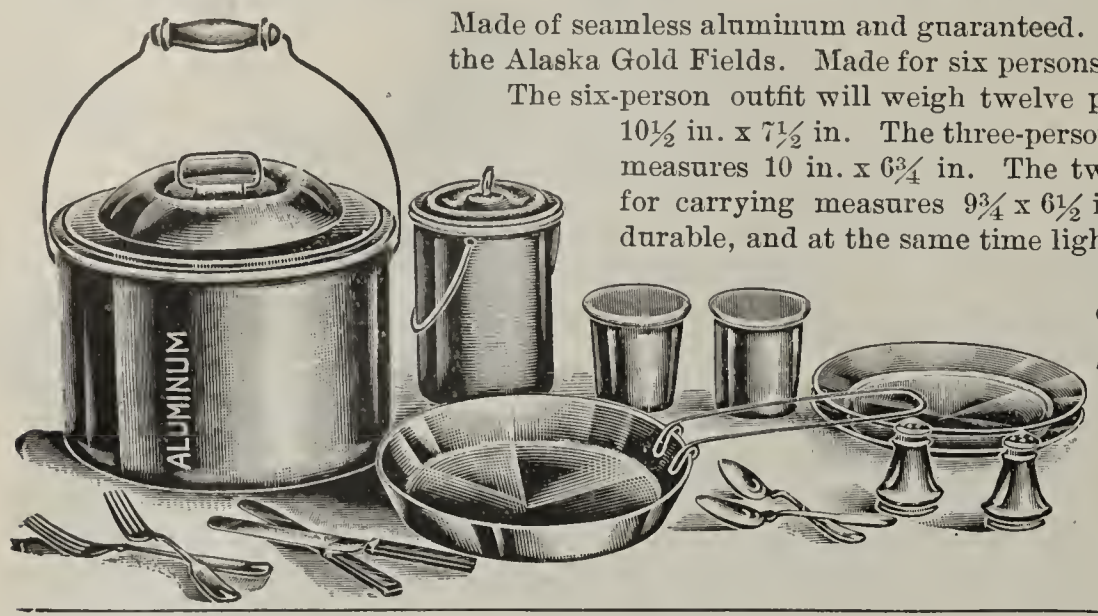
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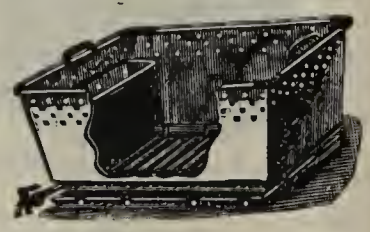
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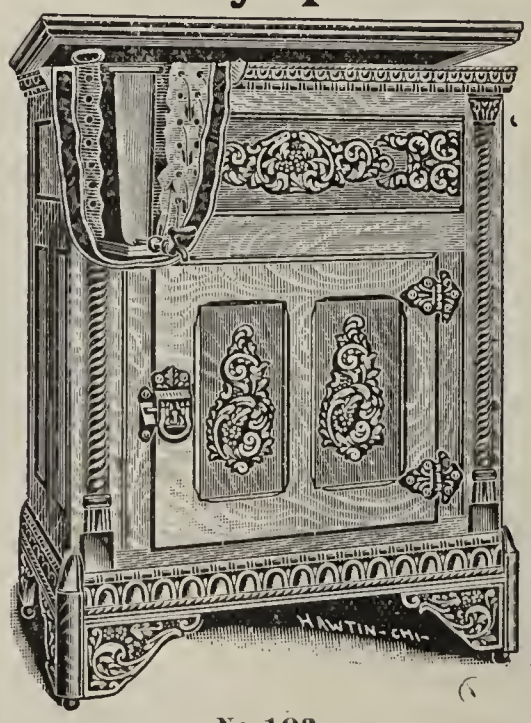
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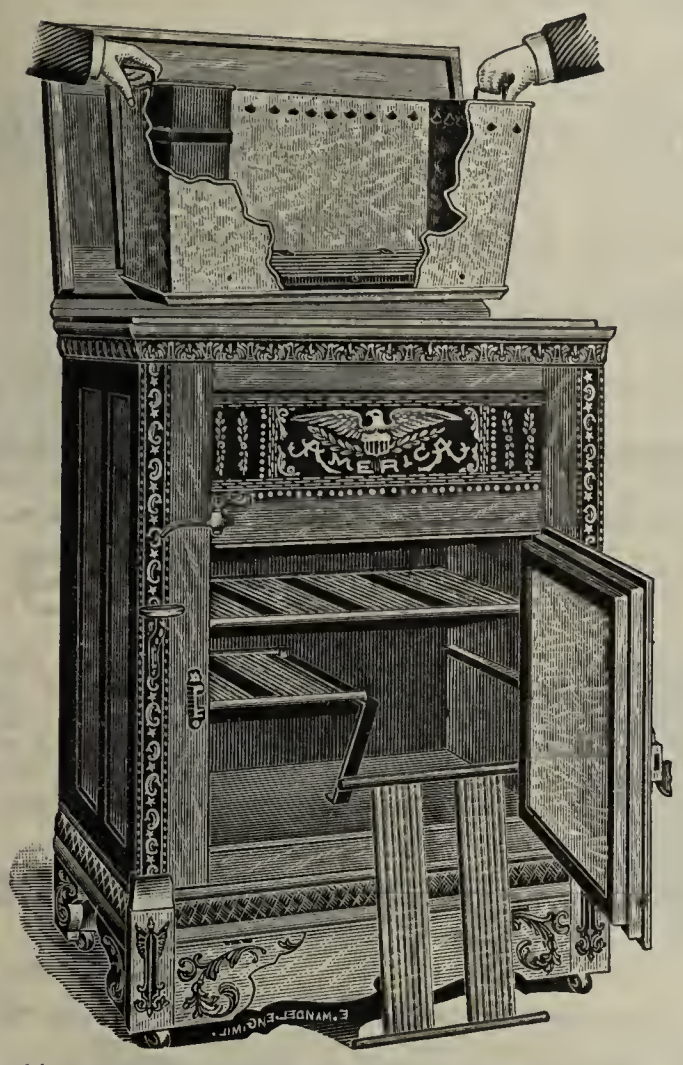
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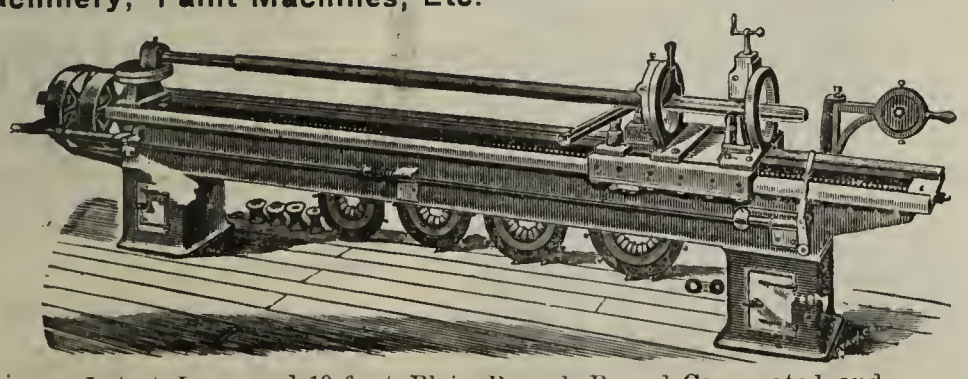
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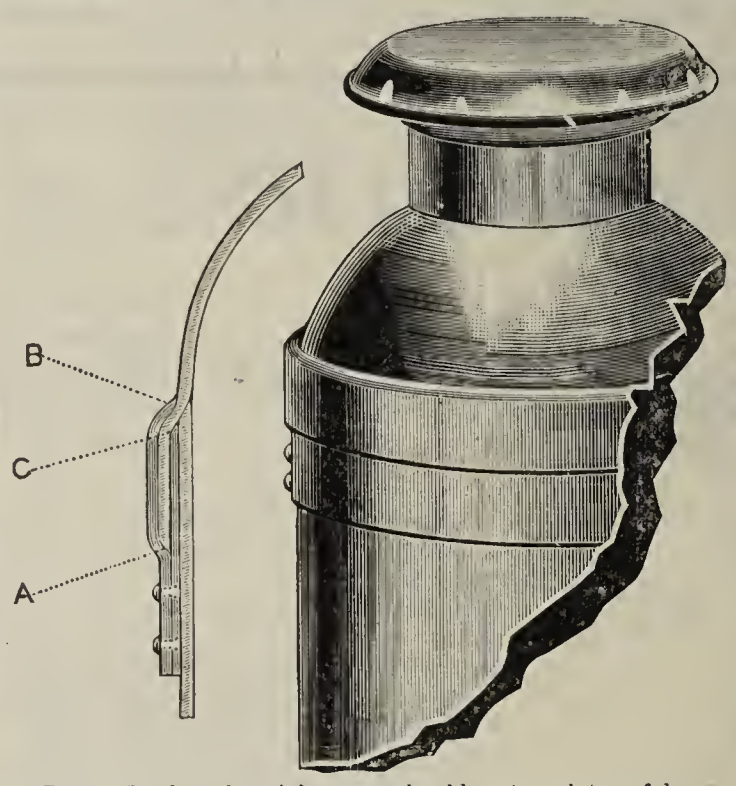
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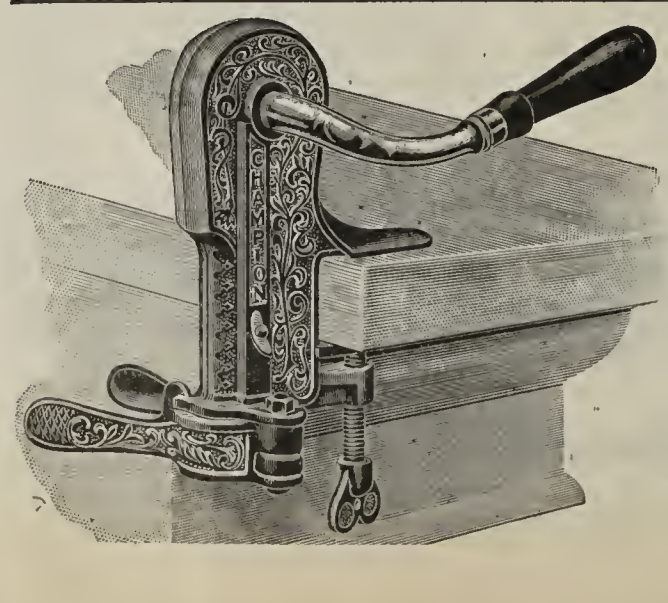
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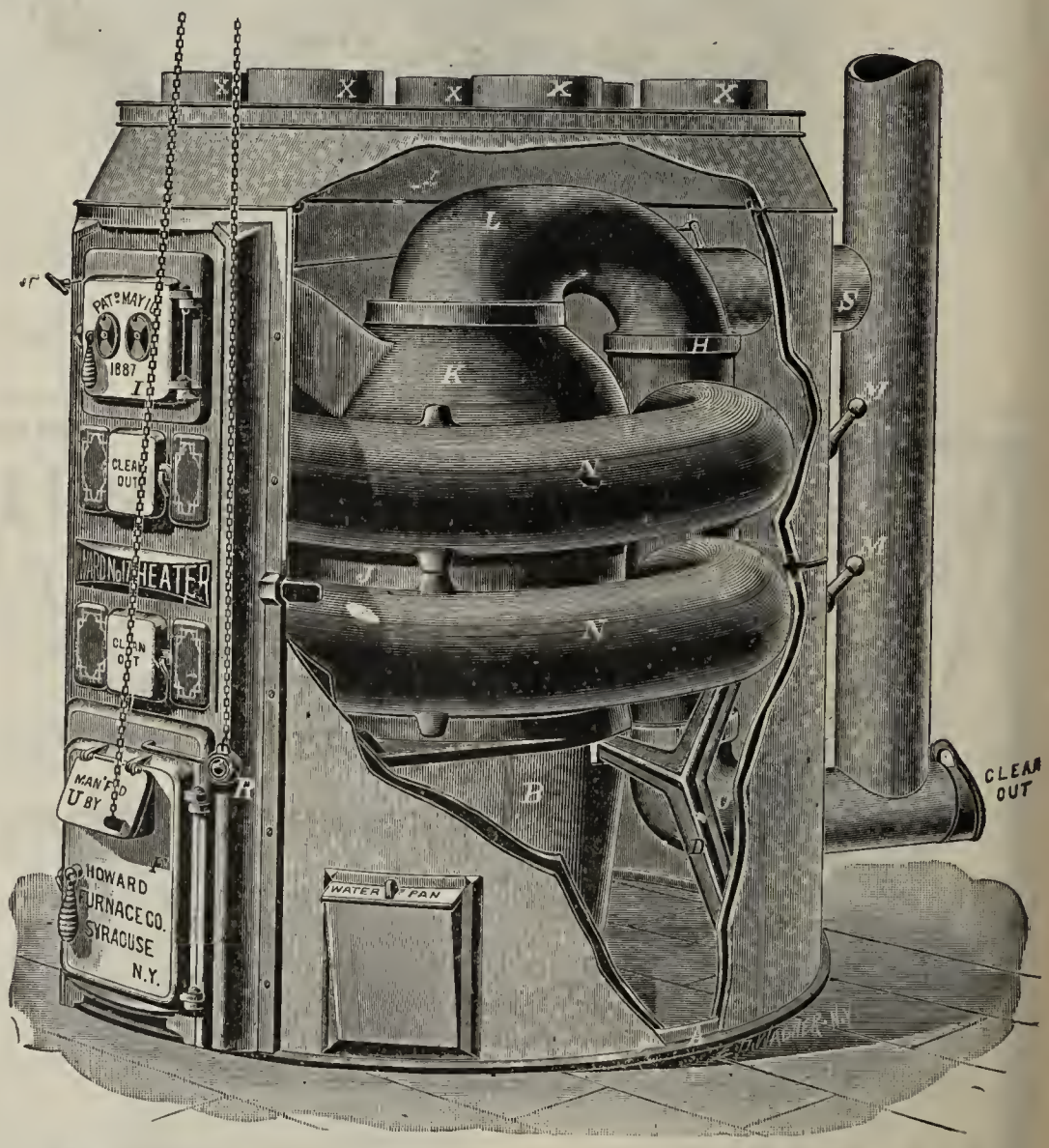
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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 12, 1898.

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The Business Situation.

The course of business during the past week has been decidedly encouraging, in view of the unsettled condition of foreign affairs and the continued war talk indulged in, for circulation purposes only, by certain sensational newspapers. The public at large are gradually learning to discredit the reckless fables put forth by this happily small though noisy section of the press, and their irresponsible utterances on public matters exert a lessening influence in business or financial circles. In Wall street the sentiment at this juncture is growing more pronounced that the $50,000,000 appropriation for national defense unanimously passed by both Houses of Congress and signed by the President this week is to be construed as making for peace rather than as a forerunner of war, and its effect has been to renew stability in market values. The stock market has had a series of moderate fluctuations, and the general public has for the time ceased buying securities to a large extent. But the tone of the market is firmer than it was a week ago, and there is an evident disposition on the part of investors and speculators to act cautiously and to quietly await the report of the Court of Inquiry on the "Maine" disaster and other further developments before engaging in new enterprises or investments. The banks are well "loaned up" and have advanced money rates materially. As borrowers are for the time being indifferent, there is something like stagnation in the money market. There have been additional engagements of gold for importation, bringing the total amount for the past two weeks up to $13,000,000. Meanwhile the markets for staples, such as grain, cotton, meat products, &c., are very strong and the demand for manufactured products in general shows a steady increase. Trade reports indicate an excellent business in the West, reaching a larger volume than for several years past at this season. The improvement is not so pronounced in the East, but the feeling in trade circles in this section is decidedly cheerful in connection with nearly all lines of business. Prices, while showing no very notable changes, tend generally upward, especially in iron and metal lines. The strength of copper is particularly pronounced and tin and spelter have gained in value during the week. Payments through clearing houses last week were 28 per cent. larger than in 1892, while compared with last year the gain was 56.2 per cent.

Plumbing Schools Here and Abroad.

Readers of English journals see a good many references to classes in plumbing in different English cities, but there is little definitely known here about the system of instruction as there carried on. Since the establishment of the New York Trade School attention has been more and more directed in the United States to the subject of manual and scientific instruction of plumbers, and as a consequence of this interest a number of schools have been established. We are fortunate in securing from Mr. Ainge of Lansing, Mich., an article which we publish elsewhere in this issue, giving the general features of instruction as followed in the English plumbing classes, and a summary of the American plumbing schools, together with a brief comparison of the methods obtaining in the two countries. The article will be found to present the whole question in a very compact and clear manner, and we commend it to the attention of all plumbing readers who are in any way interested in the advancement of their craft through the instrumentality of trade and technical schools. The recommendation in the closing sentence to the National Association of Master Plumbers will, we are sure, be in keeping with the thoughts of many prominent members of that important body. Whether the association as a whole wish to take official action in this matter is for them to decide, but what seems to call for immediate attention is the absolute lack of schools in the West where instruction in plumbing can be obtained.

The Navy of Spain.

It cannot be denied that at this time the people of our country are eagerly seeking information concerning the relative value of the navy of Spain in an engagement with the naval forces of the United States. To estimate this aright many factors should be taken into serious consideration—not only the ships, the armament and the *materiel;* not only the experience, the discipline and the *personnel*, but also the prestige, the *esprit de corps* and the animus of the two services must be given due weight. Few chapters in naval history are more interesting than those which tell of the rise and decline of the power of Spain on the sea. In 1588, Spain in the plenitude of her naval strength prepared for battle the largest sea fleet ever heard of. It consisted of 130 vessels, of 57,868 tons, mounting 2431 guns and carrying 30,000 men. It sailed up the English Channel, and it suffered a most disastrous annihilation from wind, weather and an inferior English fleet. Incompetent commanders, poor seamanship and badly shaped plans assisted as much in destroying this Spanish Armada as did foul weather and a resolute foe. The complete effacement of Spain as a power on the sea occurred at the battle of Trafalgar.

A reorganization and a rehabilitation of the Spanish Navy was begun in 1837 ; the results, not yet altogether attained, can be seen in the ships and men composing the force about which we now are concerned.

In the way of armored tonnage Spain has on the whole builded well. She has one battle ship, the "Pelayo," of 10,000 tons, formidable in both attack and defense. For the attack she has two 12.5-inch guns, two 11-inch guns, nine 5.5-inch guns and a large number of smaller guns; for the defense, a steel belt and turrets of 18 inches thickness. Her speed is about 17 knots. This vessel is not thoroughly modern; the armor is not nickel faced nor Harveyized, neither is her internal arrangement of the best. Of armored cruisers Spain possesses ready for service perhaps six. One of them, the "Carlos V," is of 9100 tons, about the size of our "Brooklyn." Her battery consists of two 11-inch, eight 5.5-inch and four 4-inch guns. Her protection is a horizontal 6-inch steel deck at the water line, a steel belt 2 inches thick and 10-inch steel turrets. Her speed is 20 knots.

Another fine type of armored cruiser is that represented by the "Infanta Maria" class, of 7000 tons displacement. The names of these six armored cruisers are "Infanta Maria Teresa," "Princesa de Asturias," "Cardenal Cisneros," "Cataluna," "Almirante Oquendo" and "Vizcaya." They have all been launched, but are not all ready by any means. Perhaps four of them could be put into active service in a comparatively short time. They are 350 feet long, 61 feet beam and 22 feet draft. The motive power consists of two sets of triple expansion engines developing 15,000 horse-power and a speed of 20 knots. The coal capacity, 1200 tons, is noteworthy; it will permit these vessels to cross the Atlantic and stay here some time before replenishing, and gives them a radius of action at a moderate rate of steaming of 12,000 miles.

Not less admirable is the arrangement and distribution of the armament. Here are two 9.5-inch guns in turrets, 12 inches thick; ten 5 5-inch rapid fire guns in battery, and over 20 of the smaller caliber and machine guns. The protection of the vessels consists of an armored belt 11 inches thick amidships and tapering to 7 inches at the ends. Ten-inch transverse bulkheads join the extremities, thus making a citadel, within which are the machinery and magazines of the ship. Over this is the armored deck 3 inches thick. In our navy there is no ship like one of these four. There can be no doubt these Spanish ships are good fighting men-of-war, and, properly handled, are capable of fighting long and hard. Not unlike these are the two armored cruisers "Cristobal Colon" and "Pedro Aragon," 6800 tons, purchased by Spain from Italy. The "Colon" is ready. Her water line belt and citadel are 6 inches thick, the sides extending up so as to protect the ten 6-inch guns. The remaining guns of her armament are two 10-inch, one forward and the other aft, in barbettes, protected by shields 5 inches thick, and six 4.7-inch guns protected by shields. Her speed is a good 20 knots.

This closes the list of Spain's effective armored fleet. We gather from it that though small it is excellent. The ships are distinctly good ones of their types. The policy dictating the type has for its object the protection of far distant colonies. Hence the prevalence of the armored cruiser. What part the armored cruiser will play in war time has not been definitely determined by naval tacticians. She is not designed for the line of battle, being as a rule too light offensively and defensively; yet there would appear to be no good reason why a bold captain in the "Maria Teresa" should not lay her successfully alongside the battle ship "Pelayo." On the other hand, the "Pelayo," ship for ship, gun for gun, armor for armor, is the better vessel. But the discipline of the *personnel* of the two may be different, the skill of the commanding officers may be unequal, the maneuvering of the ships may be unlike. These are factors which are quite as valuable as gun power and armor resistance. Indeed, they count for more, for the best ship that ever floated would have to strike her colors if badly commanded, no matter who might be her assailant.

It is a difficult as well as a delicate matter to discuss the seamanship of Spanish sailors—and we may not be altogether competent to do it. There have been great Spanish admirals. Columbus was one, though not a native, and there have been many others; and among the 1200 officers in the Spanish Navy to-day there must be many who know their profession—men possessed of that cool, determined intelligence which leads to victory or to glorious death. The same in a measure must be true of the 15,000 men now behind the Spanish guns, even though for years little has been heard of them, and that little has been lightly spoken. It is well then to indulge in no invidious comparisons in attempting to estimate the naval strength of Spain, ship for ship and man for man. Spain should be accounted the equal of her antagonist, whoever he may be, until the matter has been put to the test.

Only the armored fleet of Spain has been considered above, for the reason that, generally speaking, the armored fleet is the measure of the fighting capacity of a nation. Of unarmored ships Spain has a great number, and it would not be difficult to make additions. There are 18 cruisers, varying in size from 1100 tons to 5000 tons, and 25 of a smaller size, good ships most of them. As able assistants to these cruisers there are 12 torpedo vessels, ranging between 460 and 850 tons in size, and between 18 knots and 28 knots speed. They are a thoroughly efficient lot.

Spain's gun boat flotilla is a large force numerically, over a hundred, ranging in size between 400 and 40 tons. These gun boats have inconsiderable speed, most of them, but they are good vessels for service in Cuban waters, where many of them are now.

Of torpedo boat destroyers the Spanish Navy has four, new, as good in every particular as can be. They are of 380 tons displacement and 29 knots speed. Besides these there are 14 torpedo boats between 60 and 120 tons displacement, with speeds ranging from 19 to 26 knots.

In conclusion, it should be said that we believe the new navy of Spain to be a downright good one. There can be no doubt of the excellence of the ships, armor and guns. Of the experience, the discipline and the *personnel* we are not qualified to speak with certainty, though we know of no reason why they may not be equal to that of any other navy. Concerning the prestige, the *esprit de corps* and the animus, we have to say that we believe Spaniards to be brave, we believe them to be actuated by the highest motives, and we believe that in a determined effort to win once again that prestige which centuries ago made the royal standard of Castile and Aragon the proudest on the seas Spain will fight to her death.—*The Iron Age.*

Traffic officials of many of the Western railroads are again confronted with a great scarcity of cars Traffic is so heavy in both directions that the demand for cars cannot be met as expeditiously as is desired. A car is shipped East loaded. Under ordinary circumstances it could be unloaded and sent back immediately. Now, however, it gets a second load in the East before being sent West again, and of course the detention is considerably longer. Roads find it extremely difficult to borrow from one another to tide them over the present rush. There never was a time, perhaps, when greater vigilance was displayed regarding the movement of cars than right now.

THE LETTER BOX.

Galvanizing Wringer Castings.

From D. W. C., Westville, Nova Scotia.—Will *The Metal Worker* please give the composition used to galvanize wringers and the process?

Answer.—We reprint the following from an article by W. F. Flanders, Nashua, N. H., in *The Metal Worker* of February 1, 1895: I do not claim that the directions given in this article will enable a person to engage in the business in all its branches and carry it on without meeting difficulties that are not contemplated here, as such difficulties will be met and they can only be overcome by experimenting and experience. Galvanizing, as understood in the trades, has no connection with electricity as a part of the process, and is simply a dipping of iron into molten zinc, the iron having been previously freed from scale or sand by the use of acids or by tumbling. To all inquiries as to the best brands of metal to use for galvanizing use only a brand smelted or handled by a reliable concern, and under no circumstances attempt to galvanize with metal whose only recommendation is its low price. For galvanizing malleable iron the metal should be kept at a uniform heat of about 30 degrees above the melting point, and its proper temperature will soon be learned in practice, so that at a glance it will be known by the color. The surface of the metal should be covered with a flux of sal ammoniac to prevent the scum or oxidized metal from adhering to the work. Malleable castings should only remain in the metal until they are of the same temperature as it is. The loss from dross and oxidation is often as much as 50 per cent. of the metal used. If the castings must be freed from sand by pickling they should be placed on an inclined platform, and a solution of 1 pound of sulphuric acid and 3 pounds of water should be poured over them every three hours for a period of from 12 to 36 hours, or until the sand washes off readily. They should then be inspected, and any remaining scale or sand should be removed by a steel casting brush or with a file, otherwise the work cannot be properly coated. Castings that have been freed from sand by tumbling do not require pickling with sulphuric acid, but can be galvanized after immersion in a bath of one part muriatic acid and three parts water long enough to remove any traces of rust. Work of all kinds should be kept covered with water until the galvanizing is to be done. Then it should be taken out of the water and immersed in a solution composed of 1 gallon of muriatic acid, 1 gallon of water and 2 pounds of sal ammoniac. After remaining in this mixture two or three minutes it should be thoroughly dried in an oven that is not hot enough to burn the acid, after which it is ready to be dropped into the molten metal. After the iron has commenced to take the metal it should be thoroughly washed in the flux of sal ammoniac floating on the top of the molten metal to assist it in taking an even coat, and it is important that the flux should be kept liquid, clean and fresh to insure the metal taking as rapidly as possible to the work. The proper consistency of this flux is important to the operation, and its effect on the work should be carefully noted to keep it in as near a perfect state as possible. After the work is thoroughly coated the surface of the metal should be carefuly skimmed aside for a space, and the work should be slowly and carefully drawn out, all the while being sprinkled with powdered sal ammoniac to cause the metal to flow freely from the work to leave it smooth and bright. The work should be held over the metal till it drips; then it should be dipped in clean cold water and held there till the coating sets. If a spangled appearance is desired the work should not be wet until the formation begins, and then dipped quickly into water till the sal ammoniac is all washed off.

Water to Boiler Surface.

From A., New Jersey.—Will you kindly tell in an early issue of *The Metal Worker* what is considered the right quantity of water to 1 square foot of fire surface in a low pressure house heating steam or hot water boiler?

Note.—This is a question which it seems almost impossible to answer, owing to the many types of boilers made, but we shall be glad to have those of our readers who have experimented in this line express their views in reference to it. In consulting a catalogue of a prominent manufacturer and taking a vertical sectional boiler, we find that the intermediate section has a proportion of 3 quarts of water to 1 square foot of surface. On consulting the catalogue of another manufacturer we find that less than 2 quarts of water are provided for 1 square foot of surface. It is generally considered that owing to a hot water heating system being full of water throughout, it is not necessary that the boiler should hold as much water in proportion to the surface exposed as a steam boiler. As to the right quantity of water to be supplied for 1 square foot of surface, it depends upon the character and construction of the boiler. The quantity of water is of less importance than the provision of ample water ways to permit of a free circulation within the boiler, so that the hottest water may readily rise to the highest point. There should be no point where under heavy firing the steam globules in a steam boiler would be prevented from reaching the steam chamber, or globules of steam would form in a hot water boiler and impede circulation.

Repairing Agate Ware.

From J. G. R., San Jacinto, Cal.—Will *The Metal Worker* kindly let me know how I can repair agate ware without soldering, or if it is soldered is there any agate enamel to put on to make it look well after it is repaired? I think I saw something in reference to this in *The Metal Worker* a few years ago.

Note.—We will be glad to hear from any of our readers who can give information on this subject. The articles which have appeared in *The Metal Worker* on repairing agate ware state that the coating should be chipped away from the leak, then the iron scraped bright, so that it can be readily soldered. Nothing has come to our notice for enameling iron ware which could be used for repairing that would stand the heat of cooking. If the hole is a small one a copper rivet can be used with satisfaction in many instances.

What Makes the Radiator Noisy?

From T. B. C., Newark, N. J.—The inquiry of "J. R. M." in *The Metal Worker*, February 26, can be easily answered by himself if he will examine the construction of a globe valve. He will find that the seat of the valve disk will form a dam to hold water up to nearly half the diameter of the pipe to which it is attached when the valve is placed so that the wheel is on the top. I think he will have no more trouble if he turns the globe valves on the second-floor radiator so that the wheels will be on the side. In this position the valves will allow the water to run out of the radiator and stop the noise. A globe valve should always be placed so that it will not hold water.

Laundry Drier.

From G. H., New York.—Answering the inquiry of your correspondent, "C. B. H.," Tariffville, Conn, in *The Metal Worker*, March 5, in regard to a cheap method of building a drying room for a dwelling, I suggest that between the carpenter, the tinsmith and the stove man a very cheap drying apparatus may be constructed in a laundry room or kitchen. From my own experience in building drying rooms I submit the accompanying

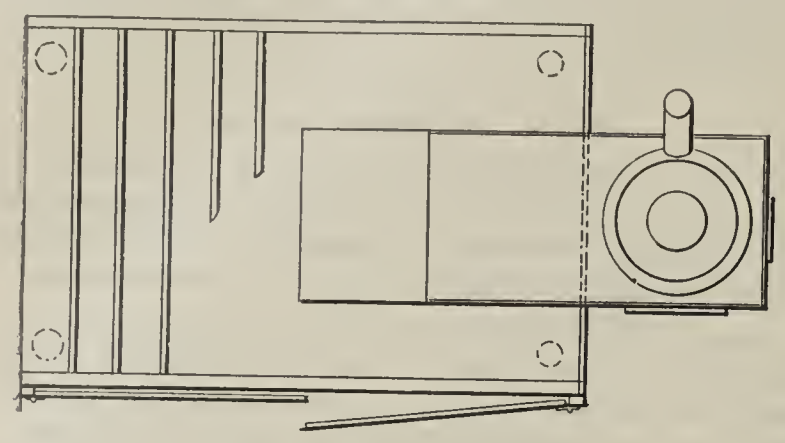


Fig. 1.

sketches, which will, I think, meet the want of your correspondent, Fig. 1 being a plan, Figs. 2 and 3 vertical sections and Fig. 4 the detail of fastenings with the clip and slide for holding the clothes horses. The plan represents a drying room 4 x 6 feet for 11 clothes horses. With continuous drying from six to eight horses is sufficient for small families. The sides and top may be matched ¾ stuff and the framing 1¼ x 2½ pine. The slides for holding the horses may be ¾ x 2 inches, with a rabbeted strip for holding the clips, nailed or screwed to it to form the groove, as shown in Fig. 4. The clips may be made of No. 12 sheet iron and screwed to the stiles of the horses. The rails may be halved and clinch nailed to the stiles. The flat top ironing stove of the stove trade is best suited if placed on the same floor with the drier, and may be so arranged that the sheet iron cover can be removed and the stove used for heating irons.

For safety the stove should be boxed in with sheet iron and a sheet iron apron extended into the room, sup-

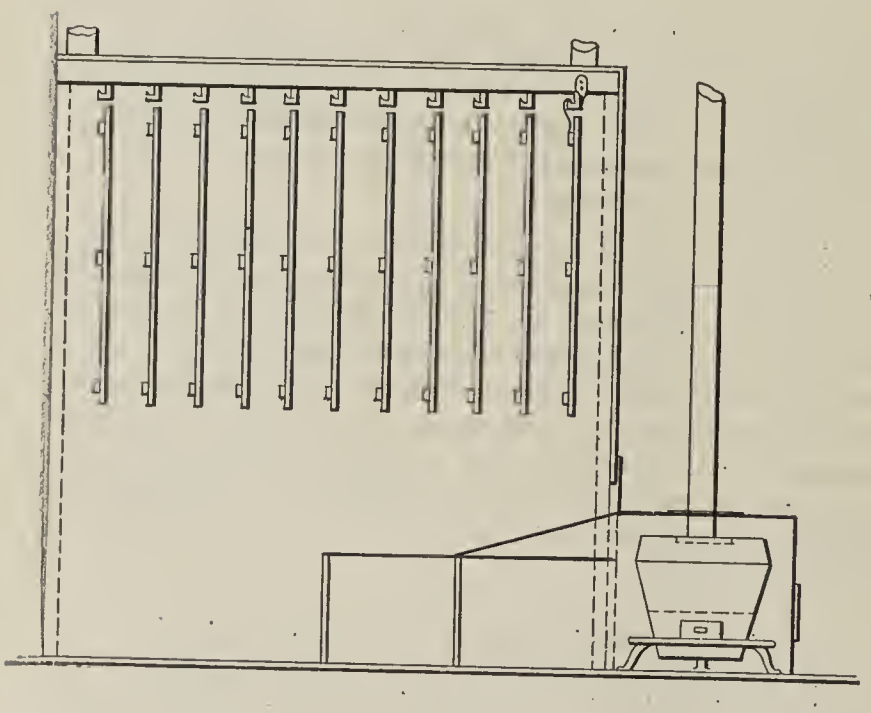


Fig 2.

ported on small stanchions, for equalizing the flow of air. An opening in the sheet iron box opposite the opening into the dryroom serves to impinge the cold incoming air directly against the stove. There should be a stove pipe ventilator at each corner brought together and carried to a chimney flue not used for fire or up through the house to the roof with a hood. If there is room over the drier the partitions may be run up to the ceiling of the room with the holes in the cover of the drier at the corners, and a single ventilator to a flue or to the roof. To charge the dryroom the horses may be unhooked and set at the further end of the room, and one at a time hung and the clothes put on—or if the heat is on, one at a time may be

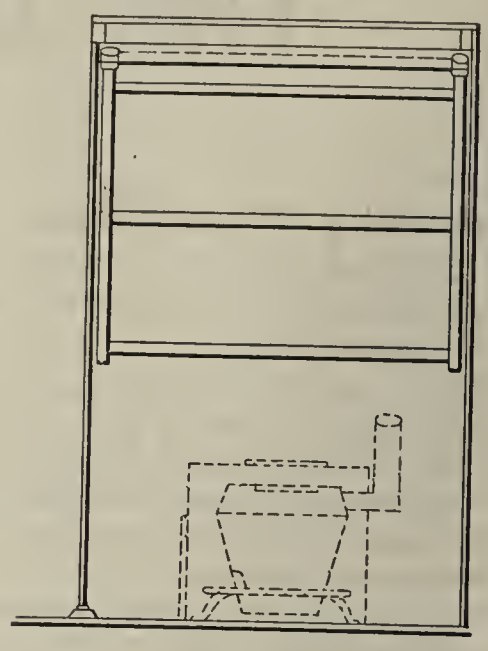


Fig. 3.

drawn out through the door and hung on a pair of hooks outside of the room, charged and slid into place. This makes a convenient and snug drier with no rails extending out into the room, and if the stove can be placed in

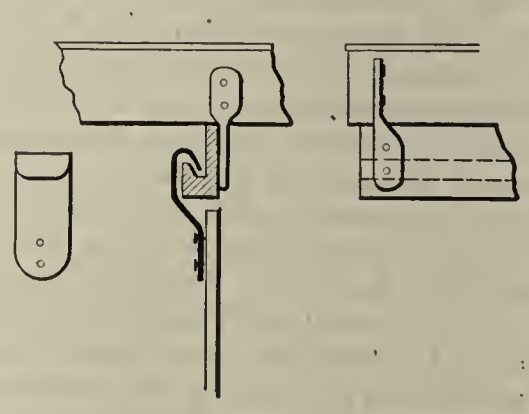


Fig. 4.

the cellar with an air casing leading through the floor the drying room may be made a neat and ornamental adjunct of a kitchen or laundry room.

Lead Lined Tanks.

From C. L., Grand Rapids, Mich.—In this country we have more or less trouble with lead lined tanks. The water has some effect on the lead so that in a short time the bottom of a tank is full of pin holes. In the first place the spots look white and after a while they turn to a dark green color. If then a knife is taken and the spot scraped it will be found that there are holes in the lead. I would like to ask if there is any protection against this trouble. I have lately painted the lining with white lead paint after the tank was ready for use and it served as considerable protection. Is there anything better than white lead, and also does any one know what makes the dark green spots on the lead? The tanks are used for pressure in the attic and are fitted with force pumps. We found at times that a little sand was pumped up and thought perhaps that was the cause of the trouble. Any information on the subject to overcome the trouble I should be very glad to receive.

The work of erecting the new steel arch to replace the upper suspension bridge across the river at Niagara Falls is now progressing with some little rapidity. For a time there was delay in the arrival of steel, but now it is reaching the point of operation in good quantities, and its erection is going forward satisfactorily.

Operations will be commenced soon on a new shaft in the coal mines at Blossburg, N. M. This work will necessitate the installation of considerable new machinery. It is also proposed to erect 18 new coke ovens on the site.

THE RETAIL STORE.

Rockford Grates.

The Rockford Grate Company, 146 to 160 Bunker street, Chicago, are manufacturers of high class fire place furniture. They have recently placed on the market the Leader grate, which possesses so many features of interest that illustrations are herewith given. Fig. 1 is a front view, showing the beauty of the design and the high character of the molded work. It is finished in bright, antique and Japanese copper, bright and antique brass, nickel and Berlin black. Fig. 2 is a front view and Fig. 3 a side view of the Leader back. The combustion chamber is a heavy round fire pot, with a shaking draw center grate, adapted to either hard or soft coal, but having no corners or projections for the lodgment of ashes. The fire pot is not only large, but projects from the tiling, so that heat is radiated sideways as well as in front. The reflecting plate and hood are so arranged that the heat is thrown forward and down, and thus the mantel is not only protected but the heat is placed where it is most needed. The fire pot and grate are made of heavy cast iron and the back of extra heavy cold rolled sheet steel, thus insuring durability in both cases. The dampers are regulated from the outside and are so arranged that when one is closed the other is sufficiently open to allow all smoke and gas to escape. The ash guard and draft slide fit closely, so that the air supply is under absolute control. A grate of this character is the cleanest because the ashes are only dropped in the center, no openings being in front to allow them to sift out. This grate can be readily changed from a coal to a gas grate.

The various styles in which the grate is made, as well as other high-class products of the company, are most attractively illustrated and described in a catalogue now ready for distribution. This catalogue is itself a work of art, being composed of heavy plate paper, the leaves fastened together with a silk cord. It comprises 64 pages, the size of the pages being 9 x 12 inches. Few publications can boast as handsome engravings and letterpress.

Albeck & Dolt, who have recently embarked in business at Manlius, N. Y., as successors of Dewey & Cadwell, are desirous of receiving catalogues, price-lists, &c. They are carrying a varied stock, including Hardware, Stoves and Tinware, House Furnishing Goods, Pipe and Fittings, Bicycles, &c., and also conduct a plumbing and repairing department.



Rockford Grates.—Fig. 1.—Front View of the Leader Grate.

F. W. Berry, Luray, Va., has moved his storeroom with stock 48 feet from the former location. The establishment is 24 x 60 feet, with two 10-foot stories. Mr. Berry has erected a wareroom, 20 x 17 feet, in the rear of the store. He handles Hardware, Stoves, Tinware, Sporting Goods, Agricultural Implements, &c.

J. Sidney Smith, one of the best known traveling men of New England, who has been for the past 27 years with the St. Louis Stamping Company and their predecessors, severed his connection with that concern March 1. Mr. Smith will be much missed by his numerous customers and his fellows on the road, among whom he is very pop-

ular. The trade will regret his retirement, and it is hoped that it may not be permanent. Mr. Smith desires, through the columns of *The Metal Worker*, to thank his

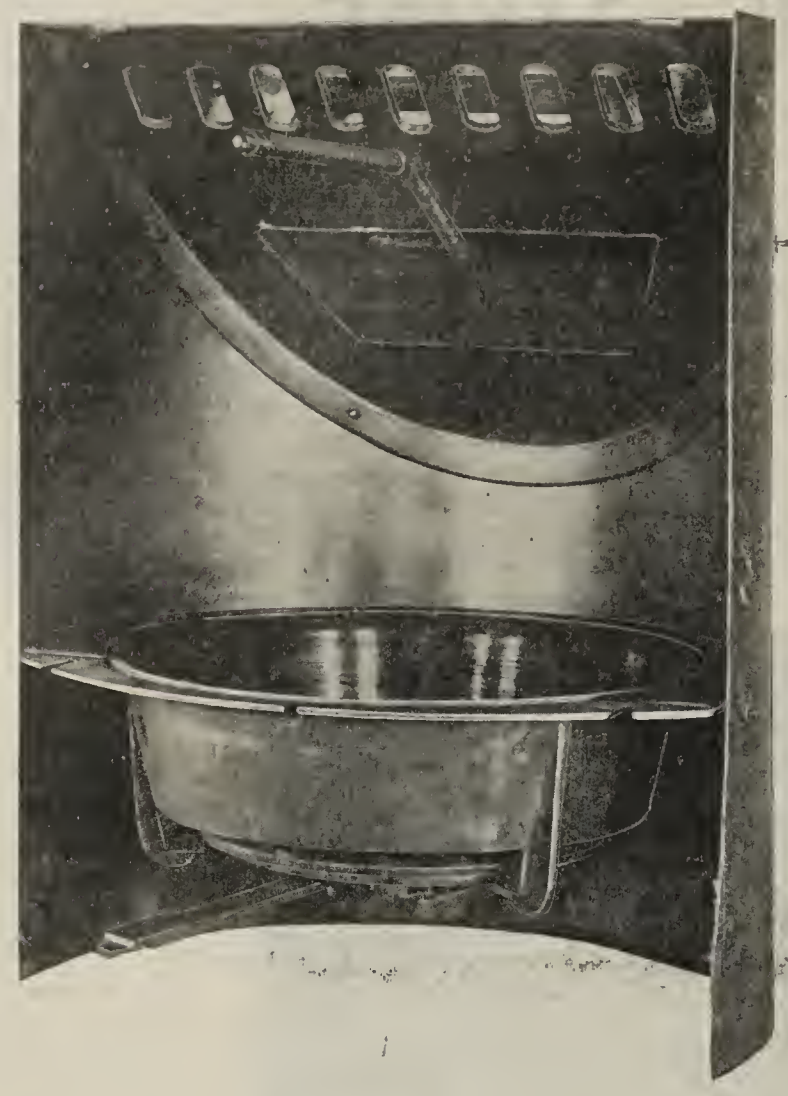


Fig. 2.—View of Back.

friends for their uniform courtesy and loyalty and to assure them of his grateful remembrance.

The Glacier Refrigerators.

The Northern Refrigerator Company, Grand Rapids, Mich., have issued an illustrated catalogue and price-list of what they describe as the famous seven-walled Glacier cold dry air refrigerators of their manufacture. Their catalogue, containing 50 odd pages, presents illustrations

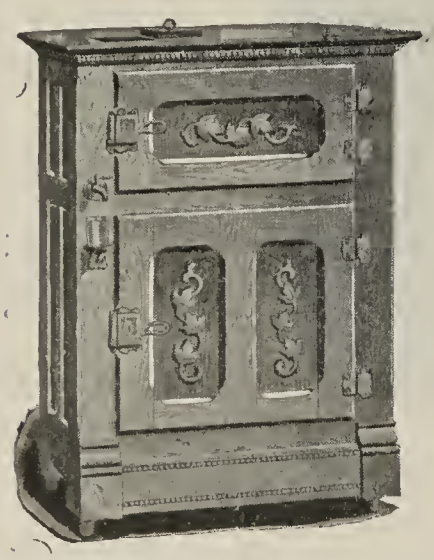


Fig 1.—General View of New Style

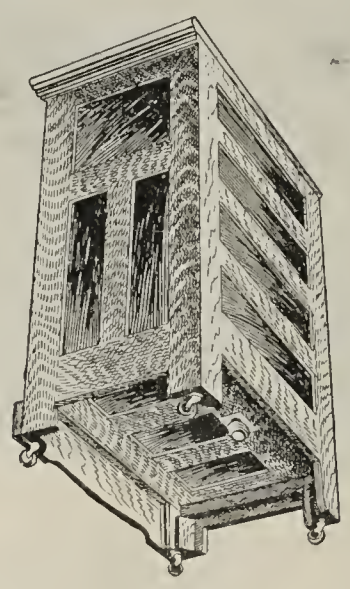


Fig. 2 —Showing Back and Bottom Paneling.

The Glacier Refrigerators.

of all styles and kinds of refrigerators of this type, besides giving descriptive particulars and full price-lists, while at the end of the catalogue are samples of the insulating charcoal sheathing and felt used in the construction of these goods. The manufacturers point out that they have made many improvements in their refrigerators this year, the new style being illustrated in the accompanying cut, Fig. 1, the changes including a complete remodeling of the design. They are now much more ornamental than before, the carvings being raised instead of sunk, and the proportions and moldings have been entirely remodeled. The backs and bottoms of the refrigerators are paneled as nicely as the fronts and sides, an illustration of an overturned refrigerator showing the bottom and back being presented in Fig 2. The manufacturers also allude to improvements in the metal work, especially in the metal ice racks and removable flues. The locks for these refrigerators are made entirely at the Northern Refrigerator Company's factory, and are of solid bronze with a wedge-shaped latch which draws the door into an air tight joint. It is pointed out that the door can be opened or closed with the foot if necessary.

MEMORANDA.

J. M. Martin is about to embark in business in Salem, Iowa. He will handle a general line of Hardware, Stoves and Tinware. Mr. Martin expects to be ready for patrons by April 1.

A. E. Marsh has succeeded to the business of S. R. Gray of Lime Springs, Iowa. The stock comprises Shelf and Heavy Hardware, Agricultural Implements, Stoves and Tinware, Sporting Goods, &c.

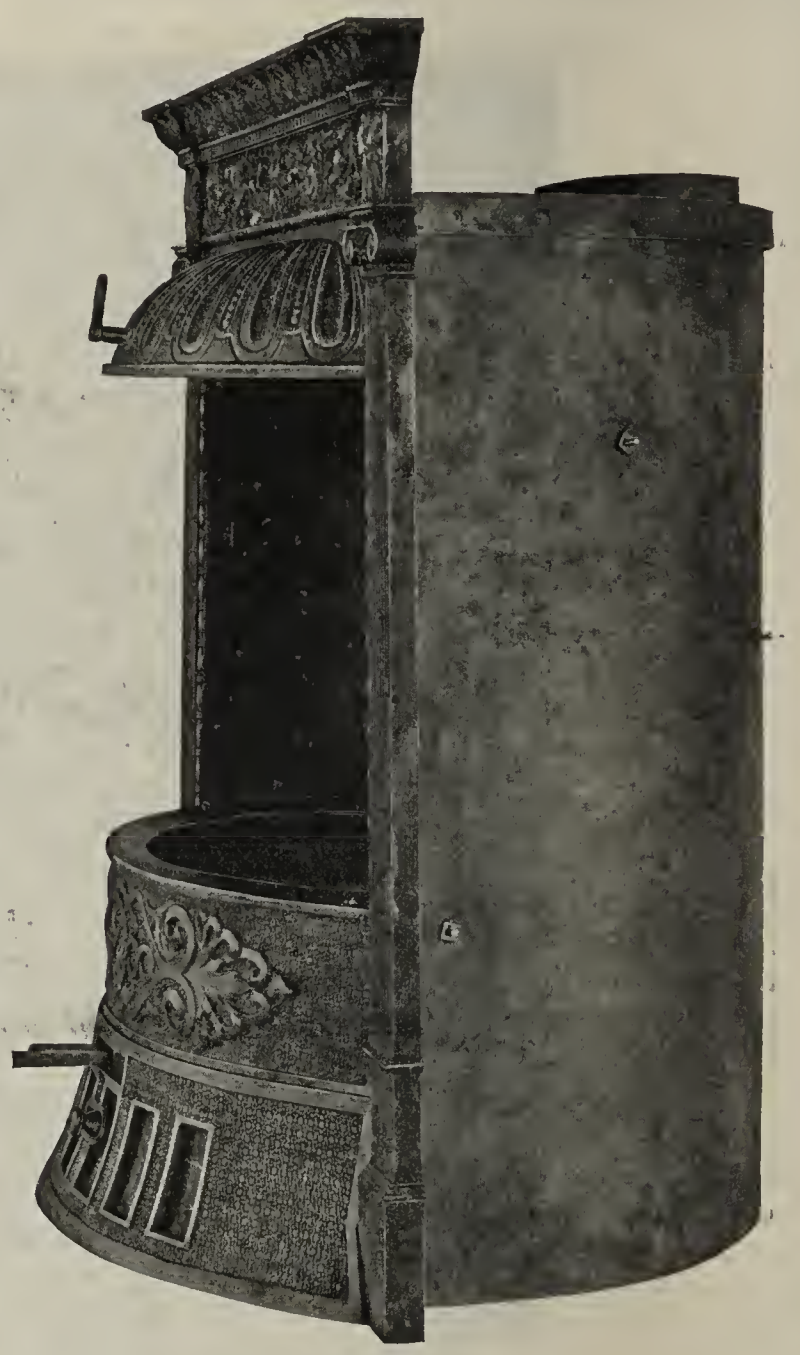


Fig 3.—Side View of Back

Noble & Hartman began the retail Hardware business in Lyons, N. Y., on February 1. They are carrying both Shelf and Heavy Hardware, Stoves, Tinware, Agricultural Implements, Sporting Goods, &c.

Gilbert & Son have succeeded Gilbert & Hines, wholesale and retail Shelf and Heavy Hardware and Stoves, New Oxford, Pa.

Theodore Sigler expects soon to open up in business in Linesville, Pa. Mr. Sigler will handle Hardware, Stoves, Tinware, Sporting Goods, &c., and will conduct business on a cash basis.

Shaw & Dibblee have bought from D. E. Curry the Hartland tin shop, at Woodstock, N. B.

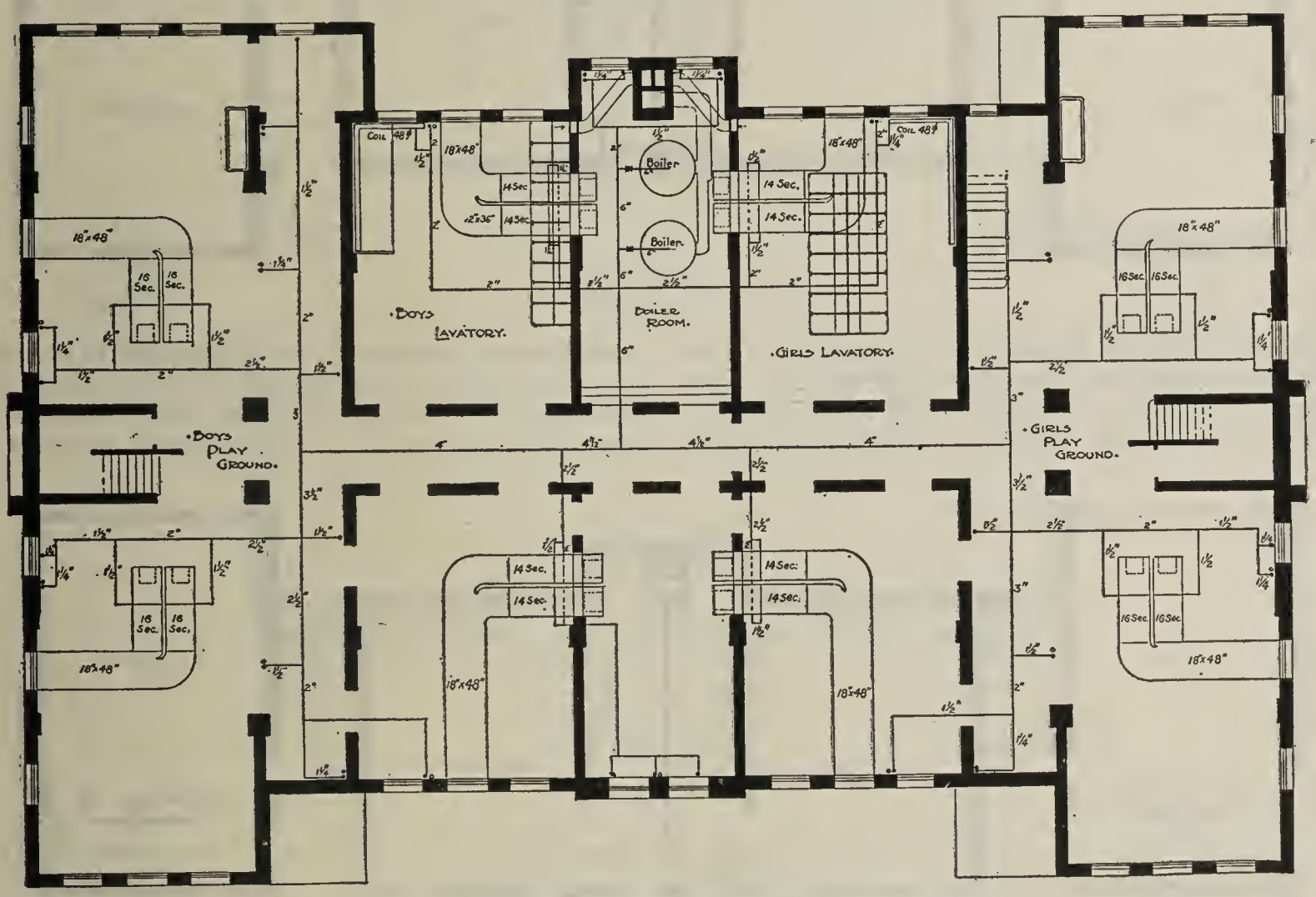
T. C. Mapes has opened a tinsmithing establishment at Sanilac Center, Mich.

William Koch, Mitchell, S. D., is modernizing his building at the corner of Main and Second streets, and when completed will use a part of it for his tin shop.

HEATING AND PLUMBING.

HEATING AND VENTILATING A BAYONNE SCHOOL.

The new Third Ward School Building at Bayonne, N. J., has been erected from plans and specifications furnished by Architect Hugh Roberts, 76 Montgomery street, Jersey City, N. J. A low pressure steam heating and ventilating system has been installed in the building by Baker & Smith of New York City, using Gorton side feed boilers made by the Gorton-Lidgerwood Company, 96 Liberty street, New York. Fig. 1 presents a plan of the basement of the building, showing the location of the two special No. 38 Gorton boilers, connected with an 18 x 24 smoke flue by means of 12-inch smoke pipe made of No. 12 galvanized iron. The heating main is 6 inches in size when this it will be seen that for each 210 square feet of indirect surface used for heating the inner rooms there is a cold air supply of 433 inches, and the area of the warm air shaft leading from the stack is 324 square inches. The corner rooms are heated by similarly arranged stacks with the same amount of cold air supply and leading into hot air stacks of the same size. The radiators used for heating these rooms, however, are composed of 16 sections and present 240 square feet of heating surface. The cold air supply and the warm air flues connecting with the stacks are so arranged that by means of mixing dampers, operated by levers placed in the various class rooms at the teachers' desks, either cold air, warm air or mixed air can be supplied at will, the damper controlling device



Heating and Ventilating a Bayonne School.—Fig. 1.—Basement Plan.

starting from the boiler and runs as shown in Fig. 1, the returns from the different radiators, risers and coils being one size smaller than the flow connection, and following the line of the main in the return to the boilers where they connect, a check valve being placed on the return at each boiler. Valves are also placed on the flow and return connection, so that either boiler can be shut out of use when desired.

Fig. 2 is a plan of the first floor and Fig. 3 a plan of the second floor. The third floor, which is shown in Fig. 4, is used as an assembly room. The class rooms on the second floor are heated by means of indirect radiation, placed at the base of 18 x 18 inch hot air flues. These heating stacks are located as shown in Fig. 1, the inner rooms being provided with a stack of indirect radiation composed of 14 sections, exposing 15 square feet of surface to each section, or a total of 210 square feet. The stacks to first and second floor rooms are placed side by side, and the cold air for supplying the two stacks is brought in through one large duct, 18 x 48 inches, so arranged that each stack gets its proper proportion of cold air. From being provided with indicators to show the position of the mixing damper and the kind of air that is being supplied. The basement is arranged to be used as a play room for the pupils, and is heated sufficiently by the steam mains and returns, which are left uncovered for the purpose. The toilet rooms or lavatories in the basement are provided with additional heating surface in the form of a coil arranged as shown, each presenting 48 feet of surface.

On the first floor direct radiation is placed in the main hall and direct-indirect radiators are used for heating the cloak rooms, which are also connected with the ventilating flues. On the second floor direct-indirect radiators are used in the cloak rooms and in the teachers' room, and the exposed piping running through the teachers' lavatory furnishes sufficient heat in that room. The third floor is heated entirely by direct radiation, and ventilation is secured by 24 x 36 inch Tuttle & Bailey registers connected with the main vent shafts, which are 48 x 60 inches in size. The vertical vent shafts at the front of the building are connected with the main vent shafts by means of vent ducts running underneath the floor of the third story,

as shown. These vent ducts are each 36 x 84 inches in size. The two lavatories in the basement are also connected with two separate vent flues provided for the purpose, these vent flues being placed so that one side is in contact with the chimney, which heats them sufficiently to produce an exhaust current. The four radiators on the front of the third floor each expose 80 square feet of surface, while all the other direct radiators on this floor expose 76 feet of surface. The direct indirect radiators used in the cloak rooms on the first and second floors and in the teachers' rooms each present 40 square feet of surface. There is exposed in the direct indirect radiators 680 square feet of surface, in the indirect radiators 3600 square feet of surface, and in the direct radiators 1444 feet, making a total of 5724 square feet. This is the actual surface exposed, exclusive of the mains. It is ordinarily supposed that direct-indirect radiation is an additional tax to the boiler over the actual direct surface exposed, and a fair estimate would be in this case that the direct-indirect surface was equal to 816 square feet of direct surface, and that the indirect surface was equal to 5400 square feet of direct surface. When this is added to the 1444 square feet of direct surface it will be seen that the system exposed equivalently 7660 square feet of direct surface, exclusive

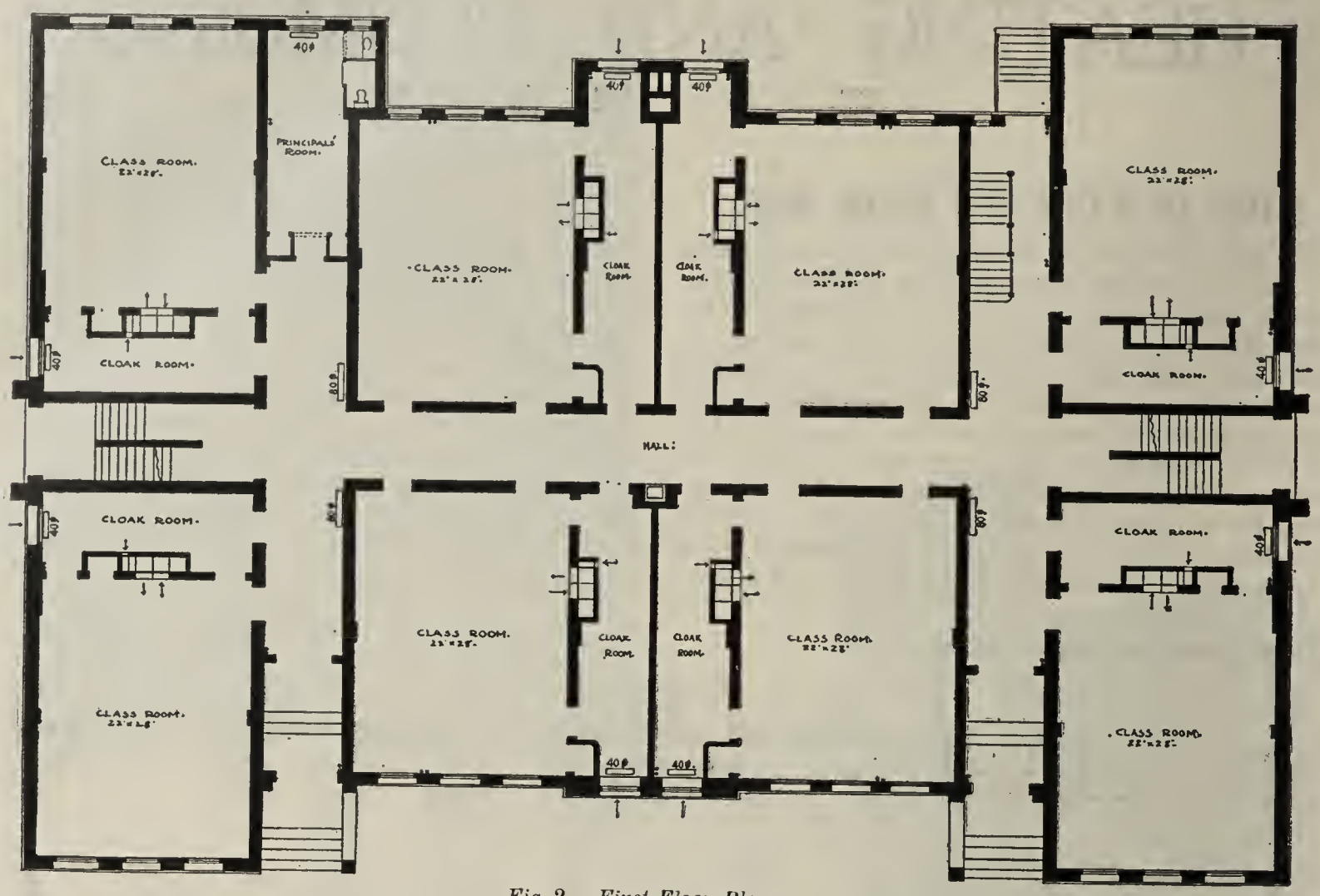


Fig 2.—First-Floor Plan

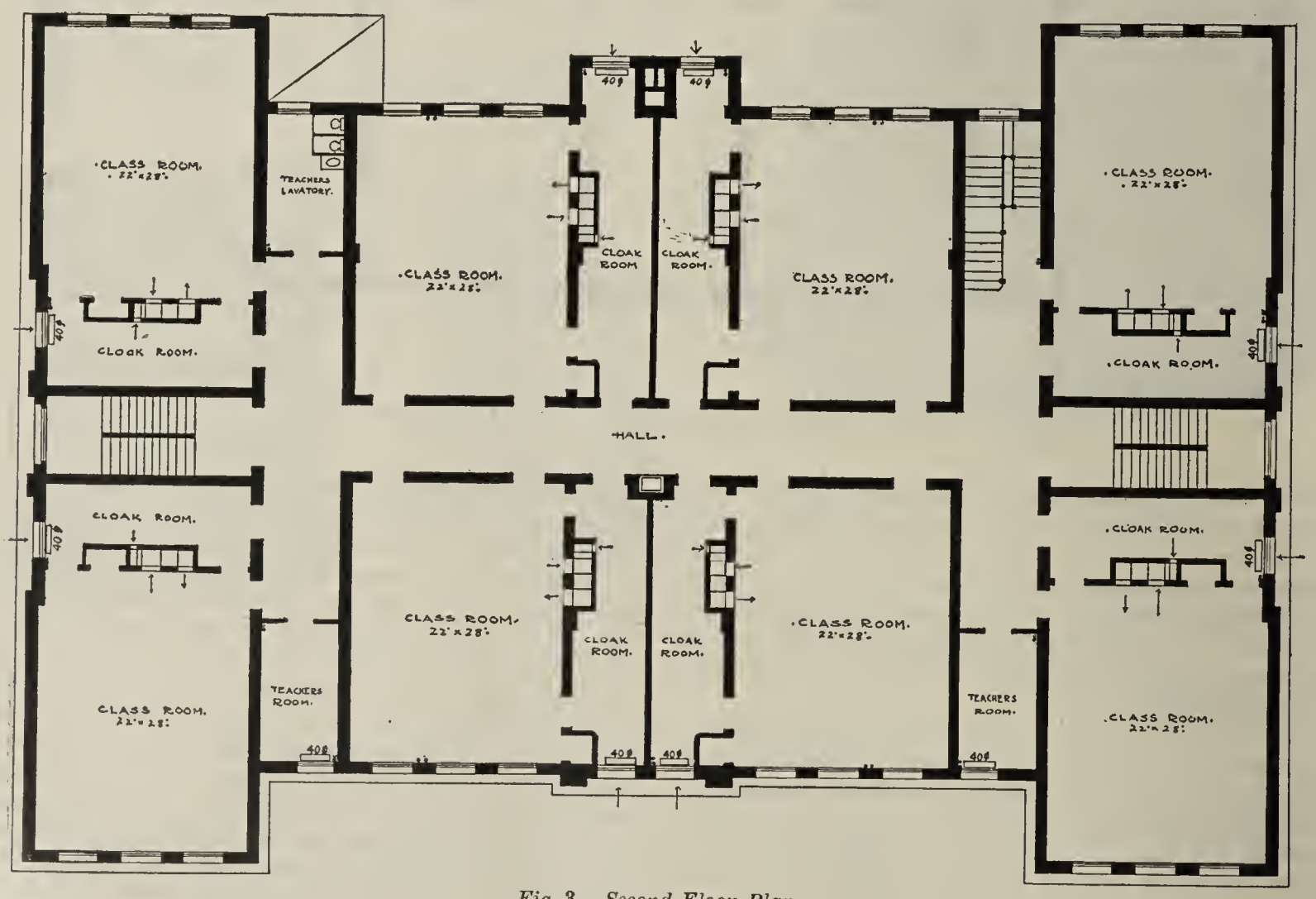


Fig. 3.—Second-Floor Plan.

of the mains and the surface exposed by the coils in the vent shafts.

The two boilers used were specially constructed with a view to the heavy work that they had to perform, and were rated by the manufacturers to be capable of carrying 2700 square feet of direct surface each, or a total of 5400 square feet. Each boiler exposed 440 feet of fire surface, or a total of 880 feet. The boilers have been thoroughly tested during the past winter, and the successful heating and ventilating of the building has demonstrated their ability for much larger work than they were rated to be equal to. This high efficiency is said to be due to the side feed feature of the boilers, the boilers being provided with a grate of 40 inches diameter, but by the construction this does not give a correct idea of the fire surface or the amount of air which may come into the fire. The diameter of the fire pot at the point of combustion is 45 inches, but by the method of feeding the fire here employed a hollow of incandescent fuel is formed, so that a much greater surface of fire is exposed than the area of a 45 inch circle. The boilers are provided with automatic damper regulators and automatic water feeders, the water feeders being arranged with by pass, so that the boiler can be fed direct when necessary.

The indirect stacks are placed in cases made of No. 24 galvanized iron, the casings providing 12 inches of air space above and 12 inches of air space below the radiators. The main cold air ducts are made of No. 20 iron and the branches of No. 22. The vertical heating flues are also lined with No. 24 galvanized iron and are painted on the outside before being placed in position. These heating flues run from the indirect stacks to a point 11 feet above the floor line of the rooms, where they discharge the warmed air. The vent flues are also made of No. 24 galvanized iron, and are provided with a register near the floor and also one near the ceiling. Ample provision has been made for expansion and contraction of all risers, and all mains have been relieved at points where necessary to aid the circulation. The steam connections to the indirect coils are 1½-inch in each case and the returns 1¼-inch. A Jenkins valve is placed on the supply and a Kennedy gate valve on the return to all radiators. Valves are also placed on the supply and return risers throughout the building and on the relief pipe from the supply riser. The Bundy Baker automatic air valve is used in connection with all radiators, and air lines run from each to the basement, where they terminate over a sink. Risers are covered with sectional covering to a point 6 feet above the floor for the protection of the pupils. The radiators and piping exposed in the school rooms are all finished in gold bronze.

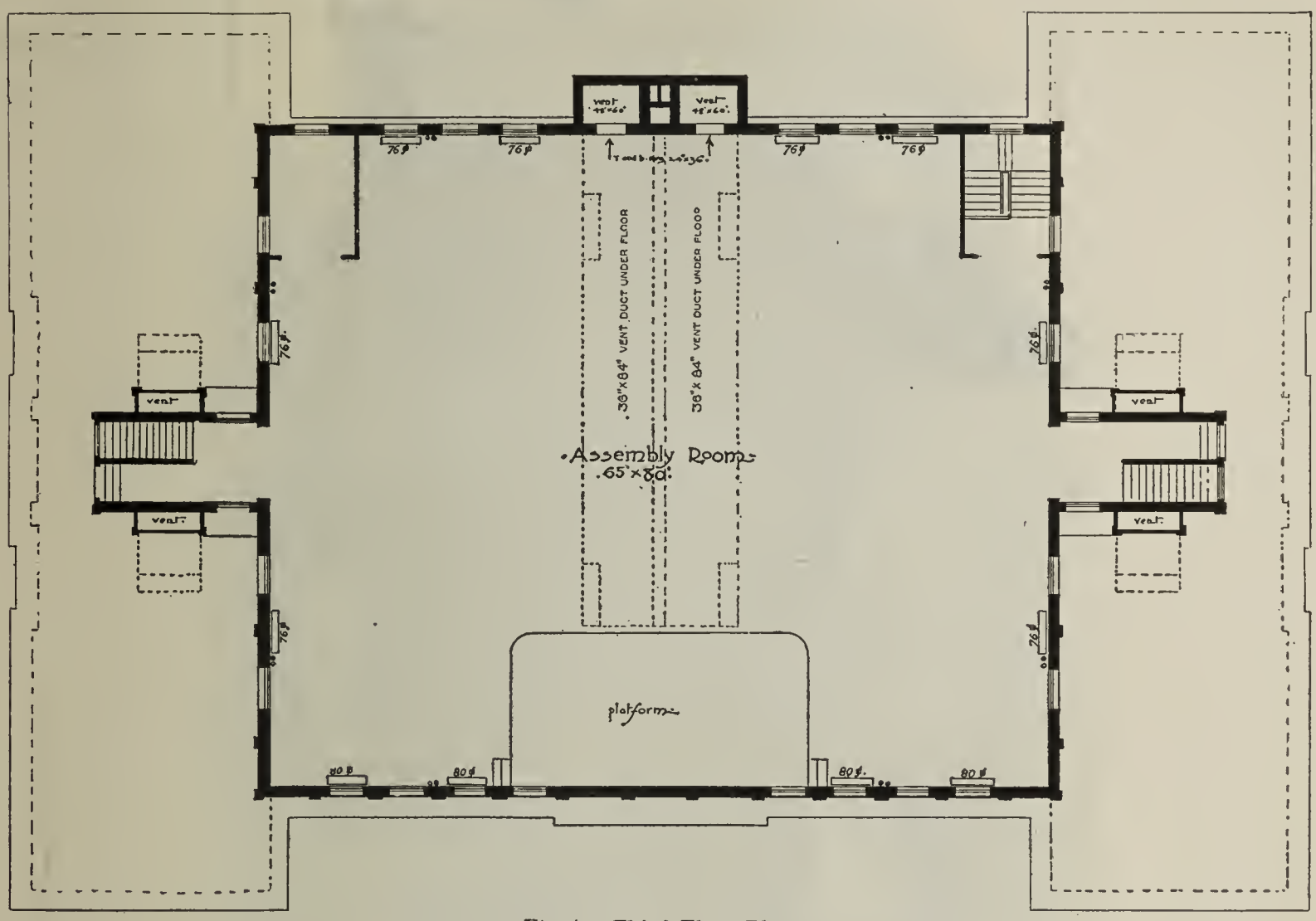


Fig 4 —Third-Floor Plan.

Gas Tied Up in Red Tape.

A Paris correspondent of the New York *Sun* describes the experiences of a Chicago woman and her two daughters who lived in the Americans' paradise for a winter, and among other things tells of the obstacles they overcame in getting the gas turned on in their apartments :

They wanted gas, so Mrs. Brown went herself to the company's office to subscribe for it and to say that she wanted it immediately.

"You shall have it within the fortnight, madame," said the clerk.

"Can't I have it before that?"

"Not a day, madame. We have to obtain permission from the city before we can consider your application. Then we must also have another permit to put it in. These things require time, madame."

The following day the comptroller of the gas mains in that *arrondissement* made a call, with a portfolio full of papers to sign. An hour after he was gone the deputy comptroller arrived with three workmen, examined all the gas fixtures, called for pen and ink, sat down and wrote out his official report of the inspection, which he signed and called upon Mrs. Brown to sign. Then he took his workmen away. The same afternoon a boss plumber, notified by the gas company, came with two more workmen and made another inspection. Mrs. Brown signed an application for this plumber to examine the gas burners and pipes to see that there was no leak, and the next day three workmen came and spent the afternoon doing this. They wrote out a certificate to the effect that there was no leak, and gave Mrs. Brown a copy of it. There was an interval of two days; then the deputy comptroller arrived, alone, with another copy of the certificate and proceeded to check the work of the plumbers ; he also made out a paper stating that there was no leak. On the same afternoon the boss plumber came back and checked the work once more. Again there was an interval, this time for a whole week, but bright and early on the eighth day the original comptroller made his appearance, his portfolio bulging with papers, and very important. He

spread out before Mrs. Brown nine separate documents, stamped, sealed, red-taped and covered with official signatures; some were white, some pink, some yellow; some consisted of but a single sheet, while others were small pamphlets; all however, bore the common brand of a Government revenue stamp, the denominations of which were from 2 cents to 50 cents. Mrs. Brown's total indebtedness for fees, including plumbing work, was 86 francs.

"Forty francs of this, however," the comptroller assured her, "you will get back when your subscription expires. It is merely a deposit."

"A deposit for what?" asked Mrs. Brown faintly.

"Why, for the approximate amount of your first month's bill, of course," said the comptroller. "The deposit is always graduated according to the number of burners in the apartment."

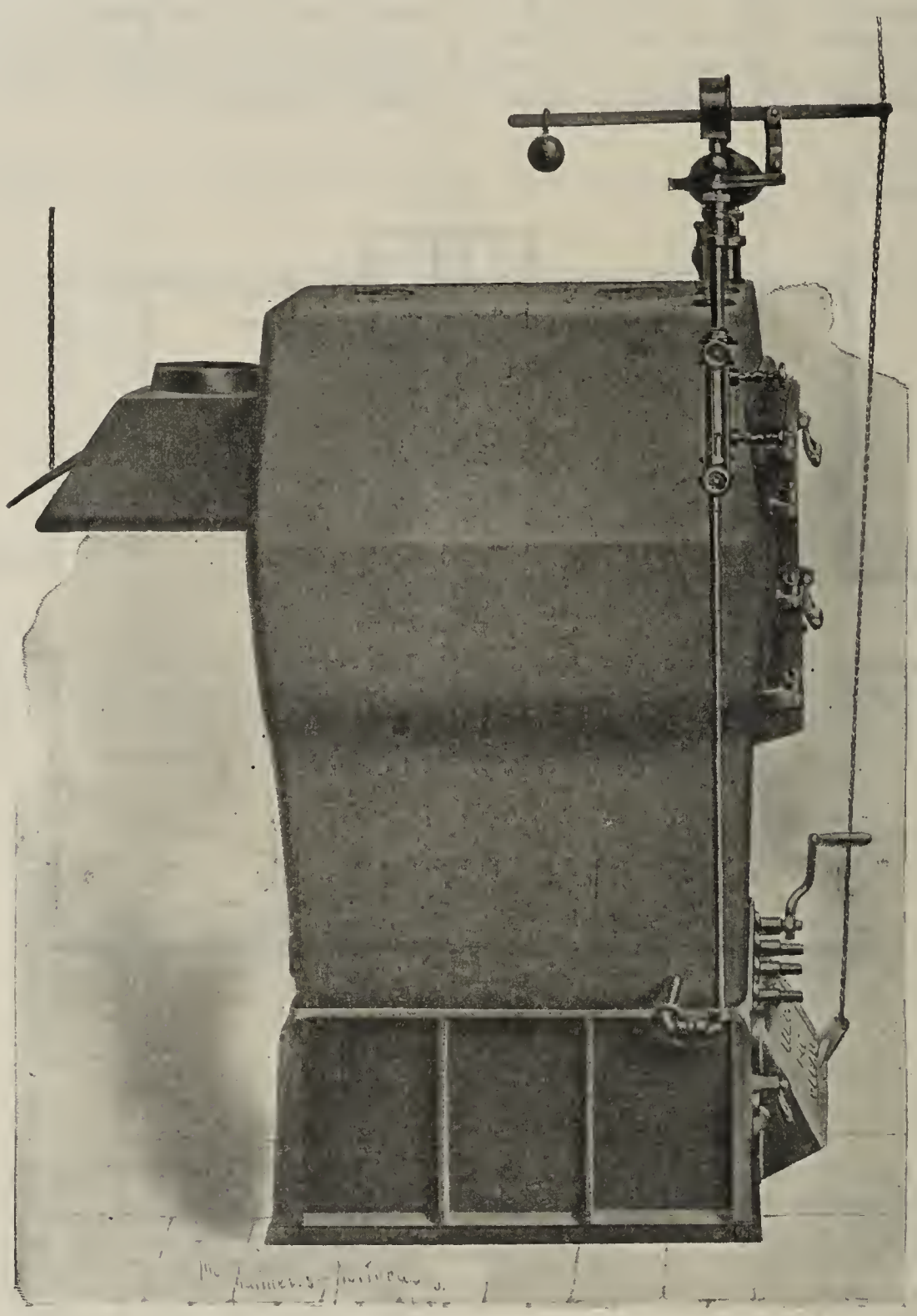
Mrs. Brown counted out the 86 francs. Then the comptroller, seeing that she had never subscribed for gas in Paris before, good-naturedly explained:

"When your bill comes in at the end of the month you will have no trouble at all, because all the charges are tabulated. The first amount on the bill will be for the gas, the second for the amount of the Government stamp for the receipt, the third the rent of the meter, the fourth the charge for the maintenance of the street mains, the fifth that for the house main, the sixth that for the stop cock in the hall, the seventh that for the stop cock in the apartment, and so on. It is really very simple."

Three days after the appearance of this man two others arrived with the meter; following them was a plasterer to place it, and shortly afterward a plumber to make the connections. The meter was still locked and sealed with a leaden seal. Two days intervened, and Mrs. Brown was about to notify the main office, because she was tired of using lamps, and, anyhow, the two weeks had elapsed. On the next day a man arrived with a book in which the inspector was to write down the record of the monthly consumption. Then in the afternoon, resplendent in gold lace, an entirely new man came on the scene. With a dramatic flourish he broke the leaden seal with a chisel, and the gas was officially on!

The Palace Regent Solid Safety Boilers.

Russel Wheeler & Son of Utica, N. Y., have developed a new type or pattern of heater, suitable for either steam or hot water heating, and designated by them as the Palace Regent safety solid heater. Fig. 1 gives a view of the external appearance of the heater as it is equipped for steam heating. It will be seen that the construction is best described by its name, as from the bottom of the fire pot to the top of the heater it is one piece work. In other words, although the casting is subdivided into many parts, by water ways and flues, yet there are no joints, the whole by means of the cored work being made in one casting. The numerous advantages resulting from this are easily understood by those interested in these devices. The freedom from joints and constant possibility of leaks is certainly acceptable. The difficulty of this work cannot be understood until one becomes familiar with the internal arrangement, which is made clear by reference to Fig. 2, which shows a sectional view with the sides broken away. The manufacturers of this heater embody in all their designs a feature which they claim to be of great value. This is in directing the course of the products of combustion toward the front of the heater, and making one more travel the entire length for the products of combustion to make. In accomplishing this with the Palace Regent safety solid heaters the water ways are arranged to place thin strata of water in close contact with large flue areas and deep fire pots, a combination which, it is pointed out, must result most satisfactorily.



The Palace Regent Solid Safety Boiler.—Fig. 1.—General View of Steam Boiler.

This heater was severely tested during the past season and its work, we are told, has been absolutely satisfactory, although it is not until now that it has been placed before the trade. A new catalogue devoted to this line will be sent to all who apply for it.

PLUMBING CLASSES IN ENGLAND AND IN THE UNITED STATES.

BY THOMAS S. AINGE.

It is noteworthy that in England the plumbing fraternity are in advance of any other body of artisans in recognizing the aims and benefits of technical instruction, and have assisted largely in the building up of the present organized system for carrying it out systematically in all the principal cities and towns in the country. Evening classes for instruction in technological plumbers' work have been in operation upward of 17 years, and such instruction is now generally recognized as a part of the ordinary training of the craftsman. The number of classes varies each year, but is steadily increasing. In 1896 there were 120 classes with 3194 students in attendance, and in 1897, 158 classes and 3533 students. Being well distributed throughout the country, the classes are within the reach of nearly every plumber and those who desire to qualify themselves in the principles of plumbing and sanitation.

INSTRUCTION IN ENGLISH CLASSES.

The classes and examinations are mainly under the direction of the City and Guilds of London Institute for the Advancement of Technical Education, the work of instituting and conducting the classes and the supervision of the examinations being delegated to a "Local Committee" in each locality. The syllabus of subjects for instruction and the papers for examination for each class are prepared by the governing body at London, thus securing a uniform system of instruction throughout the country. A similar movement has been instituted by the Plumbers' Company, but the bulk of the classes are at present under the direction of the first named institute.

As representing the popular opinion, it has been authoritatively stated that "it is not the function of technical education, as understood in England, to teach trades, but rather to supplement workshop practice by a knowledge of scientific or artistic principles connected with certain industries," and while the plumbing classes and examinations have been and still are open to those not engaged in the plumbing industry, it is probable the instruction will, in the near future, be limited to those actually engaged as workmen, or who have had experience in the trade.

The complete course of instruction is divided into three grades, "Preliminary," "Ordinary" and "Honors," and embraces the following subjects: Workshop Arithmetic, including Mensuration; Mechanical Drawing, Elementary Science, including Chemistry, Mechanics, Hydraulics, Hydrostatics, Hydrodynamics, Heat and Electricity; Building Construction, having special reference to roofs and the methods of making them water tight; Sanitation, including principally the water supply, sewerage, drainage, heating and ventilation of buildings; Gas Fitting, Specifications, General Plumbing and Workshop Practice.



Fig. 2 —Broken View, Showing Construction.

To many the list of subjects will appear formidable, but it is not expected that the plumber will enter into a systematic study, in detail, of the subjects of Chemistry, Mechanics, &c, but that he shall acquire a sufficient knowledge of the laws and principles of these subjects in their application to his daily work, especially with reference to sanitation. To quote from a recent syllabus: "He should recognize the energy possessed by a moving body of water, and that the energy must be expended before the water can be brought to rest. He will then readily understand the effect of suddenly checking the flow of water in a pipe, and the application of the same principle to the hydraulic ram. The increase of pressure in front of a moving column of liquid and the diminution of pressure at the side and in the rear will serve to explain the difficulties met with when closets on several floors com-

municate with one stack of soil pipe. The idea of stream lines in a moving fluid can be easily grasped, and from it will follow all the well-known principles of joining pipes so as to avoid eddies and waste of energy, the use of trumpet mouths, of gentle bends," and so on.

In certain cases it may be required of a student in the Preliminary grade that he shall attend a two years' course of instruction in the subjects of a common school education before being allowed to proceed to the higher grades in technology. The practical instruction is designed principally to enable the student to properly bend 1¼ to 4 inch lead pipes; to join lead pipes from ½ to 4 inches in diameter by wiped soldered joints, without the use of a lamp or gas jet, and in such positions as would occur in practice; to boss a piece of sheet lead to a given form, and to execute any other ordinary piece of lead work.

The fees for instruction and examination are nominal, and to those who satisfy the examiners in the entire course certificates are given designating the holder thereof as a practical plumber, or to that effect. Valuable money prizes and silver and bronze medals are awarded to those who obtain the first places in the examination. There is no age limit to the students attending the classes.

Commenting upon the courses of study which I have outlined, the Director of Technical Instruction for the County of Lancaster says : "The syllabus of instruction is specially adapted to apprentices in the plumbing trade, and its aim is to connect continuous and systematic instruction in the principles of science with the practice of plumbing, the instruction being spread over the entire period of apprenticeship, thus making the class work and actual training run, as far as possible, concurrently." In this connection it should be stated that in many parts of England the apprenticeship system still remains in force in the plumbing trade, and efforts are being made for a general revival of the time honored custom, but so far there is no progress to note.

SPECIAL CLASSES FOR TEACHERS

To meet the growing demand for competent teachers, special classes for the technical training of advanced student plumbers to qualify them for the position of teacher (or inspector) of plumbing have been instituted by the Plumbers' Company, and plumbers' workshops and a museum of plumbing, for the use of the students in these classes, have been fitted up under the direction of the veteran plumber, S. Stevens Hellyer.

In the operation of the plumbing classes many obstacles have been encountered, notably the lack of knowledge in the students of the principles of Geometry, Drawing, Elementary Physics and Chemistry, and in some cases of the elements of a common school education. The following extracts from the reports of recent examinations will serve to illustrate this point : "Very few of the candidates knew how to work a simple geometrical problem." "Very few appear to possess any knowledge of the most elementary principles of hydrostatics, and question 7 was in very few cases so answered as to show that the idea of water level was understood." "The candidates generally were unable to distinguish between temperature and amount of heat, and knew nothing of the pressure exercised by head of water, or the distribution of heat by convection, conduction and radiation." "Some persisted in stating that pipes burst at the time of thaw; many gave as an explanation of frost burst a diagram illustrating the change in volume of water between 0 degrees C. and 100 degrees C." "In bending a piece of waste pipe to a certain shape or pitch, they seem to trust too much to the eye, instead of setting out the exact thing on the bench and working to it, which would be the means of the piece of work fitting its intended position." "More than one advocated the use of a hydraulic ram in the question of raising water to a storage tank, overlooking the fact that the source of supply was a reservoir." "Two candidates made so flagrant a mistake as to write that 10 gallons of water could be contained in a cubic foot." "One thought that in working a pump two strokes per minute was quite sufficient, another that 55 might be got through without discomfort, while the amount of water each stroke lifted was made to vary from about ⅓ pint to 8 pints." "Only one candidate put his main drain in question 2 as 6 inches, the others preferred 9 or 12 inches and one 15 inches." "One candidate very rightly said that in testing stoneware drains with water no great head of water should be put upon them, while another would have the head of water not more than 40 feet." Over 60 per cent. of those examined in 1897 failed to obtain the required number of marks. As the candidates in these examinations were student plumbers, many of whom had received considerable class training, the question naturally arises, what would be the result of a similar examination of the vast army of plumbers who have not had the advantage of such class training ?

SCHOOLS IN THE UNITED STATES.

In the United States at the present time plumbing is taught in 12 schools, all of which are located in the Eastern States, five of which are in the State of New York and four in New York City. They are as follows : New York Trade School; Pratt Institute, Brooklyn ; Springfield Industrial Institute, Springfield, Mass.; Master Builders' Mechanical Trade Schools, Philadelphia, Pa.; Baron de Hirsch Trade School, New York ; North End Union, Boston, Mass.; St. George's Evening Trade School, New York ; Y. M. C. A. Institutes at Bridgeport and Hartford, Conn., and Scranton, Pa ; New York State Reformatory Trade School, and International Correspondence Schools of Scranton, Pa. About 540 students are in attendance at these schools, not including the two last named. The International Correspondence Schools have an enrollment of about 1000 students in the School of Sanitary Plumbing, Heating and Ventilation. Day classes are held at four and evening classes at eight schools, with fees ranging from $7 to $100 for the course. An average of nine schools shows that about four-fifths of the time during the course is devoted to manual and the remaining one-fifth to scientific instruction. Classes were formerly held at the Mechanics' Institute, Rochester, N. Y., and the Y. M. C. A. Institute, Bowery, New York, but were not a success.

As many of the schools before named have adopted a course of study somewhat similar to that of the New York Trade School, a brief description of the plumbing course of that school may be taken as fairly representative of the other schools. Day and evening classes are held, the day class consisting of a four months' course of instruction—manual and scientific—in plumbing and gas fitting, including also the drawing of plans. The manual instruction includes the wiping of joints in such positions as would be met with in practice, sheet lead work and the setting up of fixtures. The scientific instruction relates to the proper arrangement of service pipes, boilers, tanks, pumps and plumbing fixtures in general, and the arrangement, construction and ventilation of drain, soil and waste pipes. Diagrams of faulty plumbing are given to the students for correction. The evening classes are held on three evenings per week during six months in the year, two evenings being devoted to manual and one to scientific instruction. The last named classes have been more largely attended than any of the classes at this school.

ENGLISH AND AMERICAN SYSTEMS.

A brief comparison of the systems of instruction in both countries shows :

1. That in England the facilities for acquiring a plumbing education are many, the classes being distributed throughout the entire country and open to persons of all ages, and the fees nominal and nearly uniform ; while in the United States such instruction can only be obtained in a few of the large Eastern cities, in many cases upon the payment of a considerable fee, and in the best schools the classes are limited to young men only.

2. That in England the classes are under the control of one governing body, thus securing uniformity of work, while in the United States the course of instruction is selected by each individual school, and though many of these have adopted the course of the New York Trade

School there is still a lack of uniformity in the subjects taught in each school.

3. That in England the instruction is mainly of a scientific nature—which is in keeping with the popular opinion respecting the aim and scope of technical education—while in the United States, as previously stated, a large portion of the time is devoted to manual instruction in the workshops of the schools.

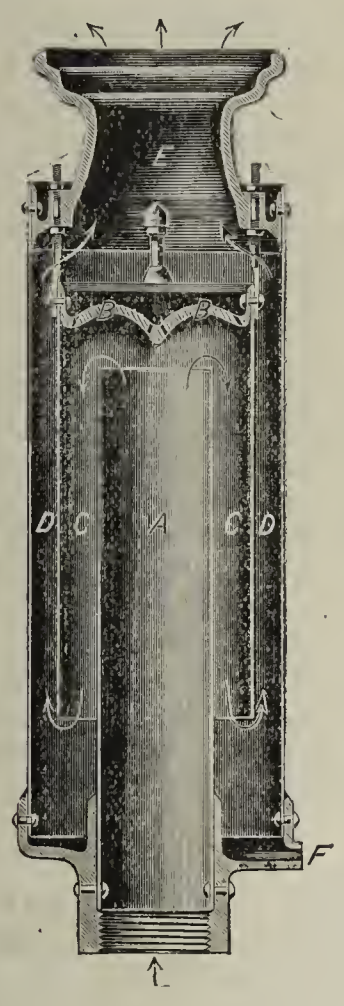
Apart from the merits or demerits of either system—and each has its redeeming features when viewed from different standpoints—what is required at the present time is a system of instruction particularly adapted to the wants of those already in the trade, very many of whom, though skillful workmen, are lacking in the first principles of technology.

A SUGGESTION TO MASTER PLUMBERS.

The existing laws for the regulation of plumbing in this country, many of which demand an educational test of the plumber's ability to pursue his calling, together with the growing demand for an extension of State and municipal control of this work, render it necessary that the plumber of to day should be well versed in the principles of his calling. The National Association of Master Plumbers has, I believe, been instrumental in securing the enactment of many of the existing plumbing laws, and I would respectfully suggest that this association would confer a lasting favor upon the plumbers of this country by similar effort toward the establishment of plumbing classes in every city in the Union.

Bundy Exhaust Head.

The Bundy exhaust pipe head, which is illustrated by the accompanying engraving, is made by the A. A. Griffing Iron Company, at their works, Jersey City, N. J.



Bundy Exhaust Head.

They also have offices at 66-68 Centre street, New York; 177-179 Fort Hill Square, Boston, Mass., and 702 Arch street, Philadelphia, Pa. The head is made of heavy iron and is so constructed as to cause the steam in passing to change its direction three times without causing, it is claimed, any back pressure upon the engine. The three cylindrical shells of which the head is composed are placed one within the other, and each is of greater area than the one next inside, that full capacity be given throughout, with the element of friction added. The manufacturers point out that there is no crimping of the iron, with its incident weakening at the point where the scale is necessarily broken, and as a result the head is likely to be of long life without any liability of repairs.

Chicago Master Plumbers' Protective Association.

Quite a number of master plumbers in Chicago who do not belong to the Chicago Master Plumbers' Association have formed an opposition organization styled the Master Plumbers' Protective Association. The officers are as follows: President, C. Hudson; vice-president, R. J. Arnold; second vice-president, W. C. D. Gillespie; secretary, J. Wyman, 954 West Madison street; financial secretary, W. Wilkie, 705 West Madison street; treasurer, W. G. Coles, 194 South Western avenue. The members of the new association are principally plumbers having small shops, who claim that the cost of membership in the Chicago Master Plumbers' Association is a serious tax upon them, in addition to their city license fee and State examination. The agreement between the latter association and most of the supply houses, however, prevents the outside plumbers from obtaining goods in a regular way, and they are compelled to purchase through other channels at excessive prices. By organizing they think they may be able to compel recognition from the supply houses. The supply men have for some time been restive under the present arrangement, believing that they should be permitted to sell to all licensed plumbers whether they belong to an association or not. A knotty question may now be presented to them as to whether the new organization is not an association of master plumbers just as well as the old one, and therefore making its members eligible to their recognition.

Baltimore Master Plumbers' Mutual Protective Association.

We have received the following letter from George J. Thaler, 800 North Gay street, Baltimore, Md., first vice-president of the Master Plumbers' Mutual Protective Association :

Referring to your article in the issue of March 5, under Notes, page 45, you say that "arrangements were made whereby the members of the Master Plumbers' Mutual Protective Association can buy their materials at wholesale prices on the co operative plan, the members agreeing not to patronize the Baltimore dealers." It is true, arrangements have been made by which members can purchase material at the right price, which all of them cannot do from the local supply houses, and the names will be given to any member who will apply, but he will not be served on the co-operative plan, neither has any one officially agreed or even said that he would not patronize the local dealers. What our members say or do individually is their own business, and must not be laid at the door of the association. It is to be hoped, however, that the local houses will soon see the folly of their ways and come into line by and by, and sell any plumber in business at the right price, whether he is a member of the local branch of the National Association or not. Just now the dealers will sell only such as are members of the National Association at anything like a fair price, and when they do condescend to take an outsider's money he pays more than fair for his material and always has to pledge himself not to tell from whom he bought the goods. To my way of thinking that is degrading to a free man, and it appears very strange that such a condition of affairs can exist in a free country, and that a body of shrewd business men like the manufacturers and jobbers of plumbing material would allow retailers, and in many cases men of very poor business qualifications, to outline their business policy for them. There are in the Baltimore city directory about 400 names of plumbers and stove men who do plumbing. Perhaps one-fourth of them are members of the local branch of the National Association in "good standing" (that means who pay their dues). Heretofore these gentlemen had things very much their own way regarding prices, the interpretation and administration of the local laws, &c., much to the disadvantage of others following the same line of trade, but who for reasons best known to themselves did not elect to become members of the local branch of the National Association. There is no reason why obstacles should be thrown in the way of the

plumbers and such who are not themselves plumbers, but who employ good, reliable mechanics who have their certificate from the Board of Examiners, just because they are not members of that august body "the local branch." It is but fair that the profit on material should go to the plumber, and that the supply houses protect the plumber, also that the laws governing the erection and maintenance of work be rigidly enforced, but it must be done fairly and impartially, and without discrimination or bias. And that has not been done in our city for some time, and it is high time that a beginning be made to abolish existing evils and bring about a more fair treatment for all, and that was the object in forming the Master Plumbers' Mutual Protective Association.

NATIONAL DELEGATES.

The convention of the National Association of Master Plumbers at San Antonio, Texas, this year will be held April 12, 13 and 14, which is two months earlier than usual, heretofore the annual convention having been held in June. This will make it necessary for the association officers to collect dues from members earlier than usual and pay the per capita tax so as to be able to elect the number of delegates to which their associations may be entitled. Only about a month now remains for this work and the election of delegates, and it should receive prompt attention. Already some cities have attended to this business, as the following will show :

PITTSBURGH DELEGATES.

A letter received from Secretary George Sands informs us that at the regular meeting of the Master Plumbers' Association of Pittsburgh and vicinity, held at the Pittsburgh Builders' Exchange March 4, the following delegates and alternates were elected to represent this association at the National Convention at San Antonio, Texas, April 13, 1898 :

Delegates : John M. Addy, J. J. Kenedy, F. J. Geery, George Addy, Frank McKnight, James Bowman, Thomas Chipp, John Cowling and D. G. Deeley.

Alternates : Charles S. Craig, Frank Tanigan, R. Carson, R. Gould, F. P. Blythe and J. O. McGinniss.

NEW HAVEN DELEGATES.

At the meeting of the New Haven Association of Master Plumbers held Tuesday, March 1, the following delegates were elected to attend the National Convention at San Antonio, Texas, on April 13 : S. E. Dibble, Andrew J. Clerkin, W. H. Hasell, T. A. Potter and Daniel M. Sheehan.

New York State Plumbers.

The convention of the New York State Association of Master Plumbers was held at Binghamton, N. Y., this week, and was called to order by President W. G. Reid of Rochester, N. Y. After transacting the regular business Auburn was selected as the place for holding the next convention and the following officers were elected :

President, Horace F. Westcott, Albany.

Finaneial and Recording Seeretary, John E. Dugan, Albany.

Treasurer, A. H. Brown, New York.

Delegates to State Convention : B J. O'Donnell, Syracuse ; W. H. Barnes, Troy, and George Cropper, Binghamton.

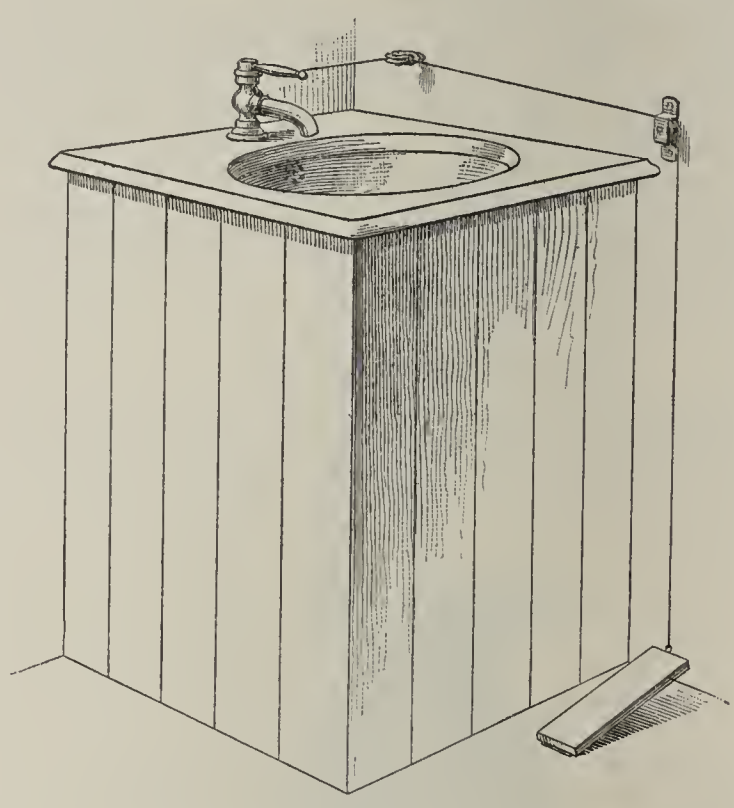
Minnesota Examining Board.

The Minnesota State Board of Commissioners of Practical Plumbing will hold examinations for masters and journeymen plumbers at St. Paul, March 21 and 22, and at Minneapolis, March 23 and 24. This will be the first examination that was ever held under the State law where the master plumbers will have to undergo an examination.

There is considerable uneasiness manifested among the master plumbers as to the outcome. As in other cities, notably Milwaukee, about one-third of the masters fail to pass. Secretary Harrington says that the examination will be theoretical and practical, and that the master or journeyman who fails to pass a satisfactory examination will be compelled to give up the business, as the board are of the opinion that the law must be lived up to.

A Convenient Lavatory Attachment.

All who have used lavatories where self closing faucets are supplied have been more or less annoyed by having to wait for water to flow into the bowl when only a small amount of washing is necessary. All prefer to wash under running water where the water supply does not make strict economy necessary. There is a difference of opinion as to the amount of water that is used by washing under running water and by letting sufficient water run into the bowl to do the washing. In the lavatory used in one of the departments of the Wilmot & Hobbs Mfg. Company, Bridgeport, Conn., the method of overcoming the delay caused by a self closing faucet is shown in the illustration presented herewith. A small chain is attached to the lever of the faucet and runs across the slab to a pulley, where a turn is made and connection with



A Convenient Lavatory Attachment.

another pulley which lets the chain drop down to the floor, where it is attached to a light lever or foot treadle, the treadle being hinged to the floor at the other end. The treadle and the general arrangement is such that the spring in the faucet lever is sufficient to close it just as soon a the weight is taken from the treadle at the floor. When any one wishes to use the lavatory, by placing a foot on the lever the water continues to run until the ablutions are completed, and if it is desired to fill the bowl while the cuffs are being removed and preparations are being made for washing, it is easy to place the foot on the treadle and let the water run.

NOTES.

An advance of 10 per cent. in the price of Range Boilers will, it is believed, confront the plumber in buying in the near future, and it is probable that the price of Brass Bibs and Brass Goods will make a movement in the same direction.

At the recent meeting of the Soil Pipe manufacturers the desirability of getting a better price for the goods was thoroughly discussed and a strong disposition to that end manifested, which has resulted in a uniform discount to jobbers, and where low prices had been made the quotations have been withdrawn.

J. M. Kaspers, Sheldon street, Houghton, Mich., is making extensive improvements in his plumbing establishment.

At a recent meeting of the Steam Fitters' Union, composed of steam fitters in Pittsburgh, Allegheny and vicinity, it was unanimously decided to make a demand for $3.50 per day of nine hours, to take effect April 1.

Articles incorporating the Master Plumbers' Association of the District of Columbia have been filed with the Recorder of Deeds at Washington, D. C. The incorporators are William Koch, Henry J. Allen, George F. Schaffer, Edward J. Hannan, Daniel Hannan and Charles E. Barrick.

Vulcabeston is described in a pamphlet by the H. W. Johns Mfg. Company of 100 William street, New York. It is composed of asbestos, india rubber and other vulcanizable gums combined with materials for special requirements. It is valuable for steam packings, electrical insulators, &c., on account of its permanent resistance to heat and immunity from injury by acids, gases, moisture, &c. It can be made in any desired form, is practically indestructible, will not shrink, expand or warp. Two kinds are made—viz., for electrical insulation and for steam packing, &c.

Among recent new incorporations is that of the Self Lighting Gas Burner Company of New York City, with a capital of $5000. The directors named are Max Spier, Percy Jacobs and E. S. Ullmann, New York City.

The Sanitary Committee of the Columbus, Ohio, Board of Trade held an important meeting recently and effected an organization, electing Dr. Otto Arnold chairman and George Dun secretary. Dr. Barbour, a member of the committee, called attention to the urgent need of public water closets in Columbus. The city is trying to secure conventions, is securing a great many, said he, and it is urgent that immediate action be taken on this matter. A special committee, consisting of Dr. Arnold and Mr. Wells, was appointed to investigate the problem as it has been solved in other cities and to report the results to the City Council for their action. Dr. Arnold is to investigate the system in Cincinnati and Mr. Wells that in New York.

C. N. Camp of Hull, Camp & Co., 129 Worth street, New York City, returned this week from a trip through New England in the interests of their specialties and the Cleavaue Air Valves, the Scaif Boilers and their Wrench for radiator unions. Mr. Camp reports the condition of trade to be quiet, but was fortunate in securing some large stock orders.

Joseph F. Moore of the Monitor Iron Works, manufacturers of Soil Pipe and Fittings, at Worth and Centre streets, New York City, is about to enjoy a vacation on the coast of Georgia.

W. E. Newman, Hillsboro Center, N. H., is making a fine display of Sanitary Plumbing in his show windows. Brass and Nickel Plated Piping is used and the mechanical work reflects credit on the workman.

Benjamin C. Smith & Sons of New York have been incorporated to carry on a Plumbers' Supply business, with a capital of $10,000. The directors are B. C. Smith, B. E. Smith and F. A. Smith of Brooklyn. The new company have moved their business to the opposite side of Pearl street from their old stand, and they are now a few doors nearer Beekman street.

The City Council of Toledo, Iowa, have adopted an ordinance requiring the use of water meters, and those who wish to use city water must make application for a meter before May 1. The meters will be furnished at the city's expense.

The Ogden Plumbing Company of Fort Wayne, Ind., have gone out of business, the stock and material having been purchased by Emmett Martin.

The Ohio Brass Company have purchased the plant of the Mansfield Buggy Works, at Mansfield, Ohio, and are placing machinery and making the necessary changes to occupy the plant May 1.

Rankin & Kellogg, architects, 1024 Walnut street, Philadelphia, Pa., have been awarded the contract to prepare plans and specifications for a new post office building, to be erected at Camden, N. J., at a cost of $150,000, which will have a complete system of steam heating and ventilation and a plumbing system. The Hon. Adam Clark Smith of Camden will be superintendent of construction.

The City Council of Omaha, Neb., have appointed Charles H. Kessler, a master plumber, and W. E. Thatcher, a journeyman plumber, as members of the board for the examination of plumbers.

A fire recently occurred in the establishment of L. B. Hartung & Co., plumbers, Canton, Ohio, in a building owned by President McKinley, doing a damage of $2000 to the stock and $1000 to the building.

George Neilsen has leased a storeroom next to the Weber Hotel, on North Main street, Pittston, Pa., for a plumbing shop.

A committee composed of Henry F. Peck, Andrew Shiland, Jr., Frank C. Warren, P. N. Welch and William H. Hart, representing the stockholders of Peck Brothers & Co., New Haven, Conn., held a meeting Friday, March 4, for the purpose of forming plans for the reorganization of the company.

Forest Hooper of Woburn, Mass., has erected a building for the manufacture of his Patent Ball Cock, Patent Clean Out and other articles of interest to the plumbing trade, and for the use of his plumbing business.

John Porsch, Erie, Pa., announces that for 30 days only he will send two of Porsch's Molded Wiping Cloths instead of one for a dollar, just to introduce them. The working surface of these Cloths is made of fine mole skin or herring bone ticking, as the purchaser may desire. The Cloths are used to wipe joints on any size of pipe from ½ to 4 inches.

John Sullivan, a plumber, formerly in the employ of Van Vergell & Co. of Carbondale, Pa., has entered the plumbing business and set up a shop for himself.

The Helios Carbide Specialty Company of Philadelphia, Pa., are erecting a large factory at Pleasantville, N. J., for the manufacture of Brass Specialties necessary for the use of carbide gas.

At the regular meeting of the Master Plumbers' Association of Worcester, Mass., it was voted to secure quarters in the Builders' Exchange as a place for holding meetings and storing the properties of the association.

A. S. Reed has purchased the Pump and Plumbing establishment of C. F. Monroe, on Main street, Vincennes, Ind.

Benz Brothers, Reading, Pa., have purchased a lot, 19 x 115 feet, and will erect a shop and storeroom for their plumbing business. The building will be 19 x 80 feet and three stories in hight. The rear of the lot will be used for a warehouse and stable.

George B. Barron has accepted a position as a salesman with the plumbing supply house of Smith & Webster of Chicago.

Charles Young has been elected city plumber of Alston, Mass., by the Board of Water Commissioners.

Wiltsie F. Wolfe, president of the American Society of Heating and Ventilating Engineers, informs us that the bill for compulsory ventilation passed the Senate of New York State, at Albany, on Tuesday.

The B. F. Sturtevant Company, Boston, Mass., have been awarded the contract to install Heating and Ventilating Plants in the new buildings for the Pennsylvania Institution for the Instruction of the Blind, now in course of erection at Sixty-fourth and Malvern streets, Philadelphia, Pa. The cost will be $60,000.

Tucker & Koester, 116th street and East River, New York City, are making a specialty of manufacturing Incandescent Mantels for use with Weslbach burners. Speaking of the special merit of the Mantels which they make, they allude to the improved machinery which they employ on the work and the excellent material. They also point out that their Mantel and Hood is hung over the burner with an asbestos loop.

A new Plumbing, Tin and Stove business is soon to be established in Malone, N. Y., Frank H. Monaghan and James J. Rice of Johnstown having formed a partnership for conducting such a business. The name of the firm is Monaghan & Rice and the business will be conducted in the vacant store on East Main street.

J. B. Moyers and Charles Mollart, plumbers, who have been in the employ of Cleaver & McCarter, have decided to leave Dubuque and go into business for themselves at Decorah, Iowa.

Owen H. Jones, Hartford, Conn., informs us that he has established his rights in a suit before Judge Shumway, sitting in the Superior Court, at Hartford, to patents for the Ball Cock which he is manufacturing, and which has alreadv won a good reputation among the plumbing trade.

Sheahan & Groark, plumbers, of State street, New Haven, Conn., have purchased from the heirs of the Boardman estate the land and the nine-story building at 289 and 291 State street and immediately adjoining their present quarters. The purchase price was in the neighborhood of $15,000. The purchase was made necessary by the increasing business of the firm, and it is the intention to refit the building and convert it into a first-class plumbing establishment. Among the possible changes is the raising of the structure two stories.

The Beery Heating Company, Baltimore, Md., have been incorporated by Otto Bruggeman, William A. Beery, Ira Plumley, Joseph C. Hobbs and James E. Tippett, with a capital stock of $5000.

Henry F. Meyer will go into the plumbing business with J. C. Jahn, at Fort Wayne, Ind.

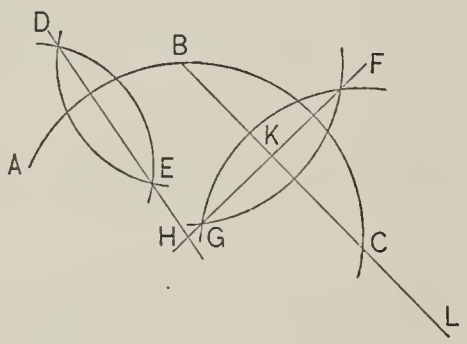
SHEET METAL WORK.

THERE IS NO NEW THING UNDER THE SUN.

The following letter from A. C. Smith, Camden, N. J., is of more than usual interest, especially to those who care to learn how they did things centuries ago. The revelations of explorers in the East are extraordinary, and, as our correspondent points out, records are brought to light which show that there were men living several thousands of years ago who did many things in pretty much the same way as they are done to-day:

We have been taught to believe that Tubal Cain was the first known cunning workman in metals. He was called by the ancients a furbisher of every kind of vessel and instrument of copper and iron, but by recent discoveries, made under the direction and expense of the University of Pennsylvania on the supposed site of the ancient city of Nimrud, in Assyria, where four cities, one beneath the other, have been uncovered, it would appear that he was not the first in his trade. Among the many wonderful things found in this last city is a coppersmith's shop, the books of which are in perfect condition, they being clay tablets, on which are printed, in cuneiform characters, the history as well as the accounts and contracts of the establishment, besides many curious diagrams, rules and problems. From them we learn that this business was handed down from father to son for 32 generations. The original was one Ham-yan, a Cushite, who flourished 4763 years before Tubal Cain. We are informed that he was acquainted with all the inventions and discoveries of his times.

Through the kindness of Dr. Pepper, Provost of the University of Pennsylvania, I have been permitted to examine copies and photographs of these curiosities, and as many of them will no doubt prove interesting to your readers, I (in acknowledgment of past favors in the way of information received through your valuable paper) take the trouble to forward you a description of some of them. In the first place is a photograph of a machine which resembles in a surprising degree a Robinson cornice brake. I am informed that it is about 4 feet long and made of bronze metal. This, as with all other finds, was turned over to the Turkish Government under agreement.



To Strike a Circle through Three Points.

We find here a rule to strike a circle through any three points not in a straight line, thus: Strike indiscriminately with one leg of the compass three points, as A, B, C; set the compass three-quarters of the distance of A B and strike from the points A and B the double arc D E; repeat between B and C; draw lines through the double arc D E and F G and extend until they intersect at H. Then H will be the center and H A will be the radius of a circle that will pass through the points A, B and C. If the compasses are not at hand the same result may be secured by the common square, thus: Draw a line from B through C indefinitely to L. Bisect B C at K. Place the point of the square at K and the edge of the tongue along the line K L. Now draw a line along the edge of the blade from K to H. Treat the other side in the same manner. Where the lines intersect at H will be the center and H A the radius. It is plain that the center from which a segment has been struck may be found in like manner; also where the chord and rise of an arc have been given. Therefore this rule may be of some consequence to "E. M. B." of Celina, Ohio. (See page 31, *The Metal Worker*, February 5.)

To find the circumference of a circle multiply the diameter by 22 and divide the result by 7.

To find the circumference of an ellipse multiply one-half the sum of the two diameters by 22 and divide by 7.

To square a circle multiply the radius by one-half the circumference.

To find the surface of a cone multiply the side or slant hight by one half the circumference of the base.

To find the surface of a sphere multiply the diameter by the circumference. This rule results in more than the actual measurement, but is nearer correct than the answer given "A. T. S." of New Jersey on page 28 of *The Metal Worker*, February 12, which was 82 5-10 square feet for a quarter sphere, one semicircle measuring 18 feet 9 inches, the other 17 feet 6 inches, with an altitude of 5 feet. This, according to the above rule, gives 93¾ square feet. If we measure this quarter sphere by triangles and allow for arcs on side and base we get 92¼ square feet, as follows: Multiply one-half the circumference of one semicircle by one-half the other—that is, multiply 9 feet 4½ inches by 8 feet 9 inches—this gives 82 square feet. Now add 12½ per cent. for arcs and we have the 92¼ square feet, and this is as near correct as can be calculated.

These ancients were undoubtedly acquainted with the principles of the voltaic pile, as one tablet cautions against using copper in connection with certain other metals for water vessels or cooking vessels, explaining that by certain laws the stronger would destroy the weaker metal. And here we find that the theory of the survival of the fittest is somewhat older than Spencer.

For the last 700 or 800 years every tinsmith, at home and abroad, has witnessed the effect of a copper bottom on a tin boiler, and knocked off these bottoms and replaced them with tin, without ever considering the cause of the effect. While I was an apprentice I made a tin boiler with a sunk copper bottom for a barber to heat his shaving water in. He was making at this time a patent hair restorer of a reddish color. He said to me on one occasion: "This boiler heats the water all right, but at times I don't know whether I am drawing shaving water or hair restorer." Some time after this, and before the water back came into vogue, I fitted up a laundry by placing a copper coil inside of the cylinder of an old heater and conducted the hot water therefrom to the stationary tubs by means of galvanized iron pipes. This gave an abundance of hot water, but in many instances the white clothes were ruined by iron rust. Remembering the barber's boiler, I at once tore out the galvanized iron and replaced it with lead pipe, and this worked like a charm. I am afraid, however, that "Plumber," Pennsylvania (page 31 of *The Metal Worker*, 19th inst.), cannot get rid of his trouble in this way on account of the iron water back. He will have to replace the copper boiler with an iron one.

They (the ancients) also understood the principles of expansion and contraction of metals, and must have had some knowledge of the principle of capillary attraction, as we find rules for the construction of copper gutters and valleys, which ought to be of some use to "C.,"

Mansfield, Ohio, but I fear that my letter will now occupy more space than it merits.

Sheet Manufacturers' Association.

A meeting of the Board of Directors of the Association of Iron and Steel Sheet Manufacturers was held in the Conestoga Building, Pittsburgh, this week. The old officers were re-elected for the ensuing year, as follows: J. G. Battelle, Piqua, Ohio, president; W. T. Graham, Bridgeport, Ohio, vice-president, and John Jarrett of Pittsburgh, secretary and treasurer. No other action of importance was taken.

Baker's Eave Trough Hanger.

The accompanying illustrations show Baker's eave trough hanger, made by J. R. Baker & Sons Company, Kendallville, Ind. Fig. 1 shows the hanger separate, and Fig. 2 shows a section of eave trough supported by them. The simplicity of the hanger will be readily seen, as it consists of a cross bar and roof straps composed of hoop steel, while the strap which goes round the under side of the trough is of galvanized iron. The parts are thoroughly riveted together, as shown, making, it is claimed, a very substantial article. While it is very readily attached to or removed from the trough, it is claimed to be impossible for the hanger to work loose, there being no bolts or nuts either in its construction or fastening to the trough. The only tool required for putting the hanger in

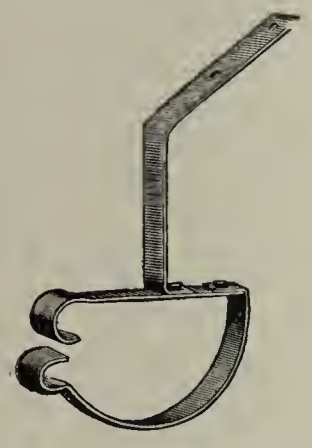


Fig. 1.—The Hanger Separate.

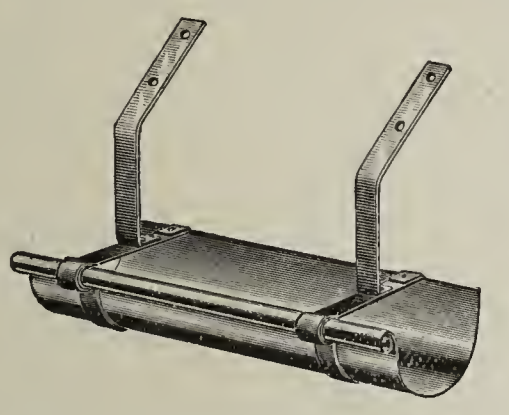


Fig. 2.—Supporting Section of Eave Trough.

Baker's Eave Trough Hanger.

position is a small pair of pincers for closing the eye of the hanger around the bead of the trough, and these pincers are furnished by the manufacturers free with the first order. These hangers are especially recommended for repair work because of the convenience and ease with which they can be put on without taking down the trough. It is furthermore pointed out that there is nothing about the hanger to cause any obstruction in the trough checking the flow of water. The roof straps are of eight different lengths, and the pitch of the trough can be easily regulated. The goods are put up in gross boxes and are furnished for any size trough with either one or two beads.

Peck, Stow & Wilcox Co.'s Catalogue.

The Peck, Stow & Wilcox Company, Southington, Conn., and 27 Murray street, New York, have just issued a complete illustrated catalogue of their goods. In size it is about the same as their 1890 book, but an effort has been made to still further condense and group analogous goods. In the front is a page on which is shown views of their five factories at Southington, Plantsville and East Berlin, Conn., and Cleveland, Ohio. The first section of the book for 130 pages pertains to Tinners' Tools and Machines for hand and power, many new goods being shown, and is followed by Tinners' Material. Next in order are Mechanics' fine Tools, many new patterns of standard goods and other articles entirely new appearing. The balance of the book, there being 487 pages in all, contains Builders' and House Furnishing Hardware, Scale Beams, Meat Cutters, Coffee Mills, Casters, Stationers' Hardware, Carriage Bolts and a multitude of goods in the way of staple lines long made by them.

The G. Drouve Company, Bridgeport, Conn., have completed a Skylight to go to Guadalajara, Mexico, which measures 40 x 45 feet.

FLASHINGS.

The demand for Sheet Iron continues excellent, and exceeds in volume anything in the experience of the manufacturers for years past. All the mills are well employed for some time to come on orders for both Black and Galvanized Sheets. Several concerns who are operating to their utmost capacity are unable to fill orders as fast as desired, and a number of manufacturers are reported to be considering the advisability of materially enlarging their plants. Mills rolling Sheet Bars have also booked a very large tonnage recently, deliveries in some cases running for the entire year, and it is reported that one or two makers of Bars are now practically out of the market. Consequently prices are stiffer all around.

The Chautauqua Hanger Company, Mayville, N. Y., issue circulars illustrating and describing the Chautauqua Eave Trough Hanger of their manufacture. It is a very simple device which can be easily applied and requires no tools to apply it, while neither solder, bolts or nuts are used in the construction or in the fastening. It is specially recommended for repair work, and it is further pointed out that being fastened to the back of the trough it does not jamb the bead, and is so constructed that it will not in any way check the flow of water. In the circular sent out by the company a number of signed and dated testimonial letters speak in the highest terms of the merits of this style of Hanger. They are made for tin trough from 3½ to 5½ inches, and for galvanized iron from 3½ to 7 inches. In the former case for ½-inch bead and in the latter for ⅝-inch bead.

A press report from Carlisle, Pa., says that a company of London capitalists have purchased a large tract of land in the vicinity of Carlisle, from which it is expected good Slate material for roofing can be procured. The product of the quarries, it is said, will be shipped direct to London wharves.

The Reeves Iron Company, Canal Dover, Ohio, manufacturers of Merchant Bar Iron, Black and Galvanized Sheets, are making some additions to their equipment which will considerably increase their capacity.

The Ferracute Machine Company of Bridgeton, N. J., manufacturers of Presses and Dies, have recently added a large erecting shop and have placed in it new machine tools, cranes, &c. They keep a force of pattern makers at work who are constantly making new styles and sizes of Presses. They have been building Presses for the Jeffrey Mfg. Company of Columbus, Ohio, for making their Elevator Buckets, Conveyors, &c. They have paid special attention to their line of Drawing Presses, and have obtained most excellent results in producing deep and difficult shapes in thin metals.

The Philadelphia Exposition.

The Committee of Fifteen for the organization and general supervision of the Exposition of the Manufactured Products of the United States to be held in Philadelphia during 1899 has been appointed by the president of the Philadelphia Exposition Association, P. A. B. Widener. This Committee is the result of action taken at a recent conference of the committees representing the Philadelphia Museums and the Franklin Institute, at which time it was recommended to the exposition that the museums, the institute and the association should each nominate five members to represent them on the committee. The result of this action is as follows:

Nominated by the Philadelphia Museums.—Dr. William Pepper, president of the Philadelphia Museums; Dr. William P. Wilson, director; Sydney L. Wright, treasurer; William Harper, chief of the Bureau of Information; William M. Watts, secretary.

Nominated by the Franklin Institute.—John Birkinbine, president of the institute; George V. Cresson, James W. Dodge, Henry R. Heyl, first vice-president; Mr. Garrett.

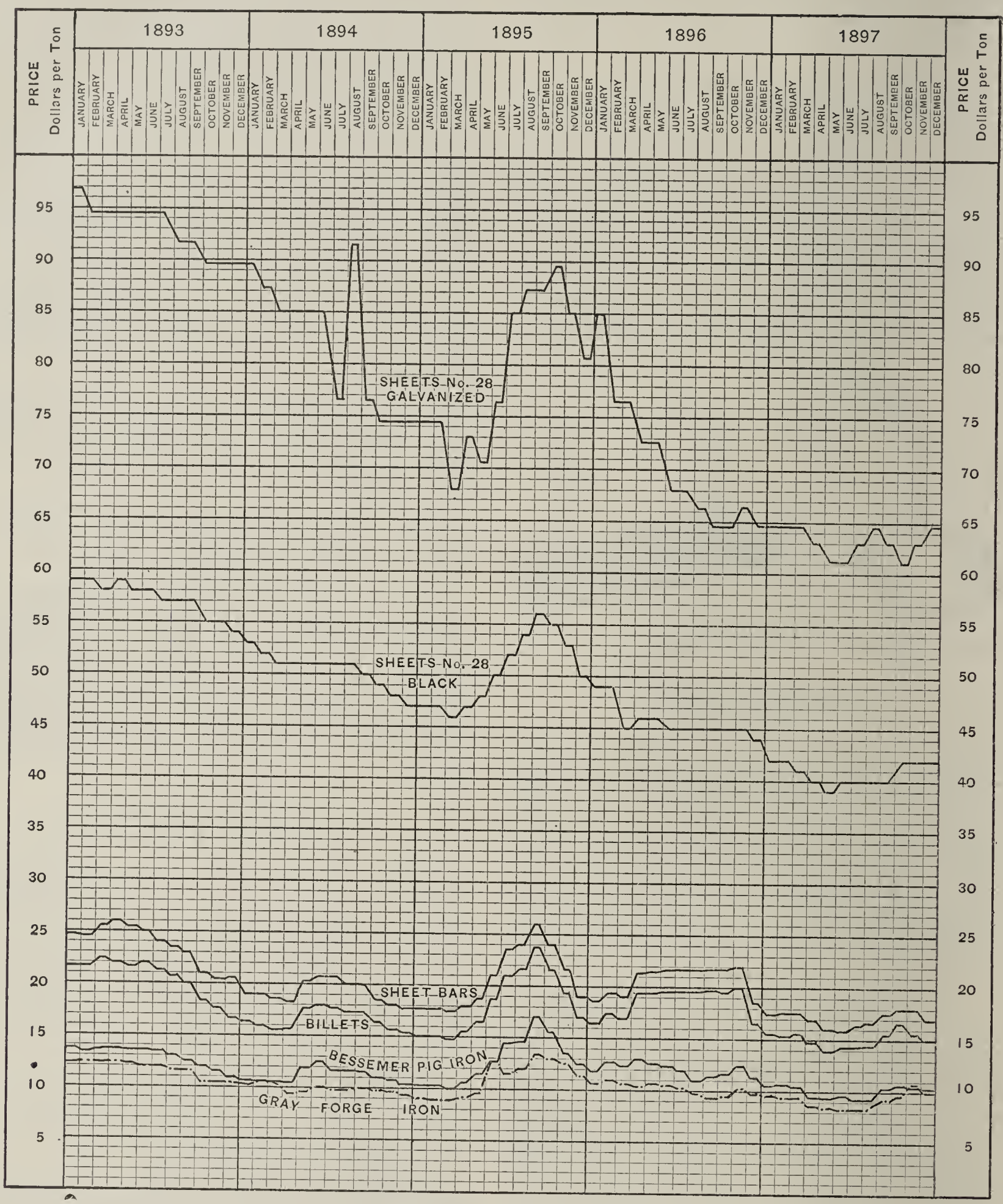
Nominated by the Exposition Association.—P. A. B. Widener, president; William L. Elkins, vice-president; W. W. Foulkrod, vice-president: Justus C. Strawbridge, chairman of the Finance Committee; Theodore N. Ely, chief of motive power of the Pennsylvania Railroad.

The Michigan State Board of Arbitration met at Detroit on the 2d inst. and reviewed the testimony taken in the matter of the strike of the riveters employed in Wheeler & Co.'s shipyard at Bay City. The board's verdict is that the 1897 rate be paid to all employees, and the riveters' and setters' wages to be $2.50 for a ten-hour day. The rate offered by the company was $2.25, but both sides had agreed to stand by the result of the arbitration.

Fluctuations in the Prices of Sheets.

The Association of Iron and Steel Sheet Manufacturers has compiled an interesting diagram showing the fluctuations during the last five years in the prices per gross ton of black and galvanized sheets and tin plate bars. There has been added to the series the fluctuations in the prices of steel billets, Bessemer pig and gray forge at Pittsburgh.

It will be observed how close is the parallelism of the lines between the crude and finished material, subject, however, to a gradual approach, which shows that the "spread" between bars and sheets is decreasing. This is particularly noticeable in the case of galvanized sheets.



FLUCTUATIONS IN PRICES OF SHEETS, SHEET BARS, BILLETS AND PIG IRON.

Gurden Corwith, metal broker, has removed his office from 101 Beekman street to 59 Maiden lane, New York.

The King of Clubs, holding a Dixon pencil, illustrates the March calendar issued by the Joseph Dixon Crucible Company, Jersey City, N. J. A quotation from "The Merchant of Venice" is added: "His scepter shows the force of temporal power."

We learn that "Wright's Trade Directory and Gazetteer," published by George Wright, 121 Fulton street, New York City, is now being compiled for the fifth edition, the first having been published in 1880. This work embraces Australia, India, China, Japan, Central and South America, West Indies, South Africa and Mexico, listing the business men of those countries according to their occupations and containing much information about distances, routes, &c., together with the tariff of the different countries. Each country is printed on a different color of paper and copious indexes are given, making reference easy to the contents. The publisher calls the attention of American manufacturers and exporters to the value of Wright's Directory in bringing their goods to the attention of foreign buyers.

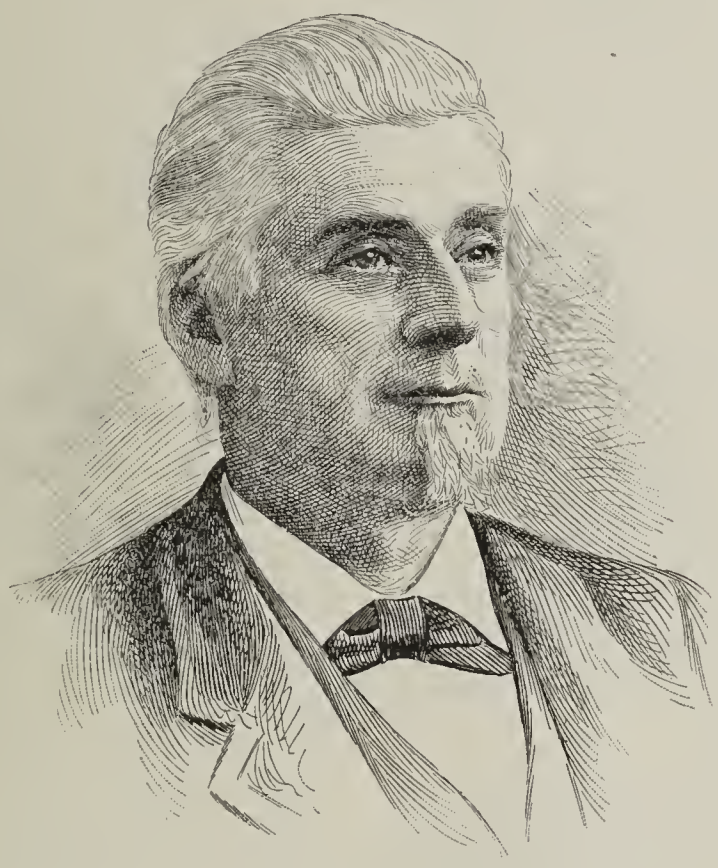
The Central Iron Works, Quincy, Ill., will build a hydraulic elevator for the Government building at Pueblo, Colo.

STOVE TRADE NOTES.

Isaac A. Sheppard.

It is with regret that we chronicle this week the death of another veteran member of the stove trade of this country. Isaac A. Sheppard, head of the firm of Isaac A. Sheppard & Co., Philadelphia, died at his residence, 989 North Sixth street in that city, on the morning of March 6. The immediate cause of his death was heart failure. For many years he had been in failing health, and toward the end of last winter became confined to his house. He suffered from no disease in particular, his breakdown being attributed entirely to habitual hard work, in which he indulged almost to the end.

Mr. Sheppard was born in Cumberland County, N. J., July 11, 1827, and was a member of a very old family, his ancestors having formerly settled in Connecticut, but removed to New Jersey in 1696. The only educational facilities falling to his lot were those afforded by a country school, with sessions three months in the year. At 11 years of age he was thrown upon the world to earn his own living. A year later he went to Philadelphia and became an apprentice in the foundry of Warnock & Leibrandt. He was a most diligent apprentice, applying himself to his trade with that earnestness of purpose which was to be his great characteristic through life. During his apprenticeship he devoted his spare time to improving his education, and being studiously inclined he made the best of the opportunities presented by a residence in a large city. As a molder he enjoyed the enviable reputation of being the best in the land. Some of the feats of work he performed when a young man are to this day considered remarkable.



ISAAC A. SHEPPARD.

In 1859 he started in business for himself, establishing the Excelsior Stove & Hollow Ware Foundry, under the present firm name of Isaac A. Sheppard & Co. The business prospering, he in 1866 established the large branch foundry operated by the firm in Baltimore, Md. Under his watchful care the business grew to its present magnitude, the active management, however, during recent years devolving upon his sons.

Mr. Sheppard was in every sense of the word a public citizen, and was active in religious, financial, educational and benevolent enterprises. He served three terms in the Pensylvania Legislature, in the years 1859, 1860 and 1861. At the breaking out of the War of the Rebellion he was chairman of the Committee on Ways and Means, and drafted the bills under which the Pennsylvania Reserves were raised for the defense of the Union. He was also one of the fathers of the Pennsylvania building association legislation under which the city of Philadelphia has flourished and become known throughout the world as "the City of Homes."

He was in 1867 elected by Councils to be his city's representative on the Board of the Northern Liberties Gas Works Company, and has been re-elected unanimously ever since, at the expiration of a term of office. In 1870 he became active in the organization of the National Security Bank, Philadelphia, serving as vice-president from its establishment, and as president from 1885 to the time of his death.

In January, 1879, he was appointed a member of the Board of Education, and in 1889 was elected to its presidency, and to which office he was re-elected year after year until 1896, when he resigned from the board, his ill health making this step imperative. As president of the board he twice sent in his resignation from the office, feeling that he was no longer able to bear the burdens of the office, but the board each time refused to accept it, preferring to elect an acting president to attend to the duties of the office. The excellent school system of Philadelphia as it exists to day is due very largely to the wise counsel and foresight of Mr. Sheppard. While a member of the Board of Education he was a member for nine years of the Committee on Property, and for six years of the Committee on Night Schools. The remembrance of his own want of educational opportunities in youth made him especially interested in the work of the Committee on Night Schools. He was also a member of the committee appointed to organize the School of Industrial Art and the Central Manual Training School.

His health not improving, he dropped one by one all the offices held by him, with the exception of the presidency of the bank, his attendance at the bank continuing until late last fall.

He was a Master Free Mason, Past Grand Master of Odd Fellows and Ex-Grand Treasurer of the Sovereign Grand Lodge of Odd Fellows. His interest in church work included 25 years' service as superintendent of the Sunday School of Zion Protestant Episcopal Church, at Eighth street and Columbia avenue. At the time of his death he was the rector's warden. He was also a member of the Union League Club and other organizations. Mr. Sheppard was a man greatly respected in business circles. He was possessed of excellent judgment, and his great tact and foresight were used to advantage in the different interests in which he figured. He was an untiring worker and thought no labor too great which tended to advance any of the institutions he was connected with. His personal attraction was such that harmony was assured at any board on which he served. In all his dealings he was most fair and just, and his charity will be long remembered by those among whom it was dispensed. The city of Philadelphia has lost a noble citizen and the stove trade of the country, with one exception, its oldest manufacturer.

Mr. Sheppard was a widower, his wife having died recently. He leaves behind him his two sons, Franklin L. and Howard R. Sheppard, who have been in recent years active in the management of the business founded by their father.

The funeral was held on Wednesday, interment being made at Laurel Hill Cemetery.

The One O'Klok Klub.

Our readers have probably waited with considerable impatience for some further account of the proceedings of the One O'Klok Klub of Chicago. This organization, which has become famous in the annals of the Chicago stove men, has not been disbanded, which might have been inferred from our long silence. On the contrary, it is enjoying more vigorous life than ever, and the daily reunions of the members are full of the true spirit of the times. The members are strongly imbued with the war fever and would go to the front with alacrity in case of hostilities with Spain, especially if a call for volunteers should be received immediately after dinner. At that time their courage is always at fighting heat. They have a choice collection of weapons in their armory, which were presented them for ornamental purposes, but could be used effectively for offense or defense. If the enemy could see some of the fearful curios in their museum they would flee from their presence in terror. At the last meeting of the Klub the redoubtable Grange Sard was observed looking askance at a new life mask of Frank Mixter of the Rock Island Stove Company, which announced his life membership in this select organization. But there are other things even more terrifying.

A New Stove Foundry.

The Bonnet-Nance Stove Company of Quincy, Ill., who have for some time been seeking a location in the vicinity of Chicago, have concluded negotiations for a site at Chicago Heights. They will have about 10 acres of land. Their main building will be two stories high, 50 x 800 feet, constructed of steel frame work and brick and stone walls. It will be used for mounting and storing stoves. The foundry will be 86 x 450 feet, 25 feet high. Switch tracks will run through the grounds and buildings, enabling raw materials to be delivered and stoves shipped out with a minimum of handling. An elevated track will run to the cupola platform, to save the hoisting of raw materials. The power to operate the plant will be furnished by two boilers and a 300 horse-power Corliss engine. The equipment is to be of the most modern and improved character. An effort will be made to get the buildings ready for occupancy by May 1. The officers of the company are as follows: J. J. Bonnet, president; R. W. Nance, vice-president; L. A. Bonnet, secretary and treasurer. Their plant at Quincy was burned some months since, and they concluded not to rebuild at the same location, although they had been in business there since about 1862.

Perfection Gas Stoves and Heaters.

The annual catalogue which has just been issued by the Milwaukee Gas Stove Company of Burrell and Chase streets, Milwaukee, Wis., is a very neatly printed and arranged pamphlet of 48 pages bound in colored paper covers. In their announcement to the trade the company state that on account of steadily increasing sales they have been compelled to secure larger manufacturing facilities, and now have a finely equipped plant for the manufacture of gas appliances, enabling them to turn out a very much larger number of goods than ever before. They have added several new ranges, grates, heaters and radiators to their line this season, all of which embody the latest improvements. Special reference is made to their instantaneous cleanable burner, so constructed that by the simple raising of a lever all accumulation of dirt from overboiling pots and kettles is forced to the surface, where it can be brushed off; telescopic oven burners which, it is claimed, enable the operator to light and regulate the oven flame without stooping down or opening the oven doors; adjustable needle valve, by means of which the air and gas pressure can be regulated independent of each other; star shape burners, which distribute the heat over the entire surface; large ovens, water heater, &c. The Perfection line of gas ranges is described and various styles illustrated together with Perfection portable stoves, Perfection gas water heaters, hot plates, laundry stoves, tinners' soldering furnaces, coffee roasters, gas kilns for firing painted or decorated china, glass ware, &c., Dresden gas kiln, various styles of gas grates, gas radiators and gas heaters. A number of testimonials and a telegraphic code occupy the closing pages of this well printed publication.

Gas Ranges on Trains.

The latest improvement on the Empire State Express, says the Albany *Argus*, is the introduction of gas ranges in the buffet cars, where steaks, chops, broilers, ham and eggs, &c., are cooked as quickly and deliciously as in any metropolitan hotel or restaurant. An idea of the popularity of this new feature of the Wagner service can be obtained from the fact that in the month of January 1243 orders for steaks, chops, broilers, &c., were filled on this one train alone, and to the satisfaction of the passengers. Here are the orders in detail:

Sirloin steaks	593
Tenderloin steaks	38
Mutton and English chops	389
Broilers	151
Quail	44
Ham and eggs	23
Total	1,243

ODD PLATES.

The business formerly conducted under the title and style of M. L. Nyberg & Co., Limited, will hereafter be carried on under the name of the Odin Stove Mfg. Company, Limited, 1216-1218 Peach street, Erie, Pa. The stockholders of the company remain the same, with the exception of the former president, M. L. Nyberg, whose interests have been purchased by C. F. Hoffstetter, who will hereafter conduct the business of the concern as president and manager. The company state that Mr. Nyberg is no longer connected with them in any capacity whatever.

Isaac A. Sheppard & Co. of Philadelphia, Pa., continue favoring their friends in the trade with attractive cards calling attention to their specialties in the heating line. The last one to reach us bears at the left a picture of a burly policeman, whose left hand grasps his club, while the right is raised in a warning manner, as though signaling to "stop." The company evidently use this picture to emphasize the remarks presented on the card, for they say that the cards will be stopped if the senders are notified that they are not wanted any longer. They go still further and say that the cards will be stopped if the dealer feels that he does not want any more business than he now has, or that he does not think it will pay him to sell the Paragon Furnace and the Excelsior Range and that his customers would rather have a cheap Furnace than a good one. The alternative which the company offer is for the dealer to send an order for a sample Furnace and Range, or write them that he is going to try and push the company's goods. Either way, the manufacturers state, will stop the cards, otherwise they will continue coming until both manufacturers and dealers see the same way.

The Atlanta Stove Works of Atlanta, Ga., have commenced operations on their new factory, which when completed will give them more than double their present capacity. The site of the new works is near Edgewood avenue, on the line of the Southern Railroad. The present molding room, we understand, will accommodate 36 molders, while the new one will have facilities for 82. Other departments will be increased from 8 to 15 and from 65 to 150. The molding room will be a frame structure, 70 x 300 feet, covered with corrugated iron. The brick warehouse will be 70 x 160 feet in size and three stories in hight, while the foundry proper will be 40 x 170 feet. We understand that the company have placed their order for a 75 horse-power engine and a 100 horse-power boiler.

The employees of the Dangler Stove & Mfg. Company of Cleveland, Ohio, held their seventh annual prize masquerade ball at Germania Hall on Saturday, February 26. We understand that eight Gas, Oil and Gasoline Stoves were given away as prizes.

The Wakefield Foundry of the Smith & Anthony Company of Boston, Mass., which was shut down for a time, resumed operations on March 1.

At the annual meeting of the Art Stove Company, held in Detroit, Mich., on the afternoon of February 23, the following directors were elected: Neil McMillan, W. H. Fernwood, Charles Campbell, Richard Renther and John O. Campbell. The Board of Directors elected Neil McMillan president, John O. Campbell vice-president and treasurer and Charles Campbell secretary.

Two large schools at Ogdensburg, N. Y., have been successfully heated during the past winter by six No. 62 Kernan All Cast Iron Furnaces made by the Kernan Furnace Company, Utica, N. Y.

The Rutland Fire Clay Company of Rutland, Vt., are distributing some neat folders calling attention to their specialties, including the Rutland Stove Lining, which is claimed to fit any stove and can be put on in a few minutes. The fire can then be started at once. The company suggest that on the outside of the stove Big-box Stove Polish be used, the claim being made that it blacks easier,

blacker and stays black longer than any other Stove Polish they know anything about. The company state that when the dealer has a Vermont Polishing Mitten and some Big-box Stove Polish, blacking the stove becomes an easy, pleasant task, comparatively speaking.

The Vogelgesang Furnace Company of Columbus, Ohio, were incorporated a few days ago, with a capital stock of $25,000. The incorporators include Frank S. Bartlett, D. A. Ebinger, Frank P. Hall, Edward W. Vogelgesang and George B. Durrant.

The Millett Core Oven Company of Brightwood, Mass., favor us with a four-page circular illustrating Millett's Patent Core Oven for use in foundries. This Oven, it is stated, has been in use for a number of years in some of the most completely equipped foundries in this country and Europe, and has given entire satisfaction, especially where quick and thorough baking of small cores was desired. The Oven is constructed of independent shelves, each having two doors, one in front and one at the back, which close the Oven when the shelf is swung out to put in or take out cores, thus effecting a great saving of fuel and heat. As usually made the Oven has six doors, each 5 inches high, and one door 10 inches high, although the manufacturers state that they can furnish Ovens with doors of any hight up to 15 inches. The front and shelves are furnished already put together and in condition to set in the brick, but they do not furnish the fire box, as every foundryman has his own way of heating. The circular shows the Oven both in portable form and for brick setting, and at the same time gives a list of some of the concerns who are using the Millett Core Oven. Among the many foundry concerns we notice some Stove manufacturers, such as the Walker & Pratt Company, Boston, Mass.; Weir Stove Company, Taunton, Mass., and the Magee Furnace Company, Chelsea, Mass.

One of the best dentist stories we have heard for some time comes from a prominent Chicago Stove man. He says that he recently went to the office of a very popular Chicago dentist and took his seat in the reception room to await his opportunity to receive some pleasing attention from the dentist. While sitting there he heard the sound of snoring coming from the dentist's operating room. He could hear the whirring of the drill and afterward the operations of the dentist's hammer mingled with the undoubted snores coming from some sturdy subject. After some time the snoring ceased and a gentleman walked through the reception room whose features were wondrously familiar to our friend. He racked his brain to try to recall who the man could be, but, his memory affording him no solution, he did not claim the attention of the gentleman, and being called to take his place in the operating room he walked in. Saluting the dentist he inquired who the individual was that had just passed through. He was informed that it was Theodore Thomas, the well-known musical director. Our friend inquired who had been snoring just a few minutes previously, and the dentist replied that it was Mr. Thomas, and the fact was then disclosed that so deftly had the dentist been performing his work that Mr. Thomas had actually been able to take a very comfortable sleep in the dentist's chair during this very engaging occupation of having his teeth filled. Could it be possible to conceive of anything more flattering to a dentist's skill than the fact that his subject could take a comfortable sleep and positively snore while undergoing such an ordinarily unpleasant experience?

The Kernan Furnace Company, Utica, N. Y., have secured the contract for and have successfully heated the Calvary Church Chapel, Utica, N. Y., with two of their No. 100 Series Furnaces and the M. E. Church of Paris Hollow with one of their Union Furnaces.

The death is reported last week in Pittsburgh, Pa., of James Graham of the Stove foundry firm of Crea, Graham & Co. Mr. Graham was in the sixty-eighth year of his age, and was formerly a member of the firm of Graham & Co., proprietors of a salt works.

The Yeager Hunter Spring City Stove Works, Spring City, Pa., are introducing a new Range under the name Majestic New Era. It is supplied in three sizes, ovens 16 x 16, 18 x 18 and 20 x 20 inches, either right or left hand. It has a cut top, with reducing covers, and is of sheet flue construction with gas burner attachment. The top and shelf are flush with the top, back and front. It has a cabinet base with 14-inch feet. The grate is removable without disturbing the water back or brick rests. There is an anti-clinker poke hole in the end. The dampers work entirely from the top of the Range, and there is a check draft slide on the top. The oven is fitted inside with roasting hooks. The Range is supplied either with or without a reservoir, and the reservoir is furnished with a spigot. End or front ash pits are furnished, as may be required. The design of the Range is very handsome and the oven door is of oval shape.

The Michigan Stove Company make an important announcement to the trade. After a series of experiments they have at last succeeded in perfecting a process of applying aluminum to oven doors and oven racks. This finish they have applied not only to all of the celebrated Garland line, but to all except the very lowest priced Stoves and Ranges in their assortment. They state that Stoves and Ranges thus treated should be eagerly sought after by neat and tidy housekeepers, as by this process of treatment the brightest and cleanest ovens are obtained. The result of this treatment is that, however thickly the inside of the oven door or oven rack may become incrusted with grease or other products of baking or roasting, all will soon burn off and leave the oven door and oven rack as bright as they were before being used. In other words, it is self cleaning. The grease can also be washed off with soap and water. Consequently a perfectly bright, clean and sweet oven is at all times assured. The company have applied for letters patent on this process of treating the inside of ovens with aluminum. Their agencies are therefore again placed in possession of an exclusive and unique selling feature, the utility of which will no doubt add largely to the sales and popularity of Garland Stoves and Ranges. The Michigan Stove Company are as conspicuous as ever in introducing new and taking features.

SCRAP.

The Ellwood Tin Plate Company, Ellwood City, Pa., are enlarging their capacity considerably.

The Ætna-Standard Iron & Steel Company, Bridgeport, Ohio, are making some very important improvements and additions to their Bessemer Steel plant at Mingo Junction, Ohio. Larger converters are being installed, new rolling mill equipment added, and the plant will be made a thoroughly modern Bessemer Steel plant in all particulars. New blowing engines are also being added to the blast furnace equipment so as to permit the operation of both furnaces at the same time, which heretofore has been impossible owing to inadequate blowing capacity. It is the intention of the firm to run both furnaces to supply metal for the Bessemer plant. This concern are also making improvements in their Sheet mill, Tin Plate and Galvanizing departments, at Bridgeport, Ohio.

Miller Brothers & Co., engineers and contractors, Tradesman's Building, Pittsburgh, Pa., have received a contract from the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., for the erection of eight Sheet and Pair furnaces for the addition to be built to the Tin Plate plant of that concern. They have received a contract for a four-door Heating Furnace for the Ajax Forge Company of Chicago, and also an order for the additional work at the Joliet works of the Illinois Steel Company.

About 30 employees of the National Tin Plate Company, Monessen, Pa., have gone out on strike, and as yet the trouble has not been adjusted. It is expected, however, that a settlement of the difficulty will be reached in a few days, as the differences between the men and the firm are said to be very slight.

The plant of the Pittsburgh Tin Plate Works, at New Kensington, Pa., has been compelled to close down temporarily owing to a break in the water works service.

The Lalance & Grosjean Mfg. Company, New York City, are contemplating the addition of two new hot mills to their Tin Plate plant at Harrisburg, Pa. The plant is running full in all departments at the present time, a fourth tin mill having been recently put in operation. About 300 hands are steadily employed. Nevertheless the existing requirements of the company's factory at Woodhaven, L. I., are so large that the entire output of the Harrisburg mills is not enough to fill them.

The Welsh & Kerry Mfg. Company of Reed City, Mich., have opened a branch factory at Saginaw, Mich., for the manufacture of Tin Plate boxes and other wood specialties. The company have enough orders for Tin Plate boxes on their books to keep this department busy in both their Saginaw and Reed City works for an indefinite time.

W. C. Brown, 36 La Salle street, Chicago, manufacturers' agent for the sale of Bar and Sheet Iron, Tin Plate, &c., is distributing favors among his friends in the trade in the form of excellent lead pencils bearing his name and address.

Although it has been readily understood by the tin plate trade in this country that since its virtual establishment, at the time of the enactment of the McKinley tariff laws of 1890, the industry of South Wales has been suffering materially, the failure of two of the largest mills on the other side came rather in the form of a great surprise. Morewood & Co., the largest manufacturers of tin plate in Wales, have announced the fact that they are unable to meet their payments. This concern possess realizable assets of great value and are a firm of high reputation. The entire force of workmen has agreed to an immediate reduction of 15 per cent. in wages. Directly after the Morewood failure the Morriston & Midland tin plate works closed down, throwing 600 men out of employment.

TRADE REPORT.

METAL MARKET.

Pig Tin.—Only a fair amount of business has been transacted during the last week, but the market has maintained its firmness and prices for large lots have had an upward tendency. Transactions in the London market, however, were large, and the business was probably better than at any time during the year. There has been a total absence of speculative movement, which is indicative of the fact that last week's business was transactive solely for consumptive purposes. Up to this writing arrivals have been small. They amount to 285 tons. There is considerable afloat, however, and as far as can be ascertained at present about 1000 tons can be expected within a week. The demand for Tin in mild quantities has not shown any change, and prices though stiff are not quotably different from a week ago.

Copper.—The market is holding its same strong position and is decidedly in the sellers' favor. It is absolutely devoid of any speculative movement, and all of the metal that is purchased is purchased on account of an absolute necessity to supply consumptive demands. The market is dull, but exceedingly firm. Companies claim a fairly good demand for home consumption, while export demand does not seem to be up to the asking price. Exports so far this month have been small, and amount to 1694 tons for the week closing March 7, as per Metal Exchange returns. The unusual activity of the electrical works in this country occasions what demand there now is at the present high figure. The price for Copper in small lots is unchanged. Sheet Copper is in good demand at unchanged figures.

Pig Lead.—There has been an easy market during the latter part of the week under review and the buyers have all in their favor. Our Chicago correspondent reports heavy sales and steady prices, while from St. Louis we hear of a fair demand at firm prices. In this market there is no change to report in small lots, and manufactured Lead remains at former quotations.

Spelter—Is firm and has an upward tendency. Prices have advanced over last week's quotation and there is a great consumptive demand. In small lots there is no change to record.

Antimony.—The market is firm, with an advance of 10 points in Hallett's, and we now quote Hallett's at 7¾c. and Cookson's at 8c. to 8⅛c.

Nickel.—Is still holding at 33c. to 37c., according to quantity and delivery, and remains inactive and unchanged.

Tin Plate.—There is comparatively little doing just now, as the dealers are entirely nonplussed regarding the movements of the committee which is promoting the proposed consolidation scheme. Many rumors have been afloat regarding the subject, but none have as yet stood verification. The rumor that P. Armour proposed interesting himself in the scheme to the extent of the much needed $3,000,000 was emphatically denied by him last week. In our endeavor to confirm the rumor that the Western makers were bringing the "combine" to a close independently of the "Big Four" in New York, and that another Chicago capitalist had decided to do what Mr Armour refused to do, our correspondent telegraphed us: "He is not working on consolidation scheme; nobody at work here as far as can be learned; local makers say they have no faith in the scheme." Nevertheless, rumors persist in certain quarters that a scheme of regulation of some sort is not dead, and even that the plan for selling out the works as broached in New York a month or two ago still has a spark of life in it. There is a strong feeling with some that action should be taken toward harmonizing the work of the mills, if to no other end than that the crossing of orders and the consequent waste of money for freight charges might be saved. By districting the country, it is pointed out, there would be the saving of long distance freight charges, each region being supplied from nearby mills. Plans of this sort have been carried out in other departments of the Iron and Steel trade, but it remains to be seen how far the Tin Plate trade can follow any plan of co-operation. There is only a fair demand for Tin Plate in small lots at unchanged prices. Stocks of Coke Plates in this market are somewhat broken, but prices do not stiffen.

THE IRON MARKET.

Between the conflicting statements relative to the consolidation of the Wire interests the truth lies midway. Far from having been accomplished, as announced, the negotiations have taken an adverse turn. The Pittsburgh Wire Company have withdrawn altogether, but a final rupture has not yet taken place between the bankers and one very important concern, whose own estimate of the value of their property and business, as represented by the option given, differs widely from that placed upon it by the accountants, on the basis of which the bankers have made an offer. Whether these differences cannot be reconciled may develop at an early date. It would be going too far to say, however, that the whole plan has fallen through. If it does interesting developments may be expected in the Steel market, out of which the Wire interests have kept, so far as covering for future delivery is concerned. From Pittsburgh comes the report that that movement has already begun in a moderate way. Whether the Wire trade generally would be adversely influenced is discussed with some interest, although it hardly seems reasonable that personal differences should tell.

A little better feeling is developing in the Cast Iron Pipe trade, which is so influential a factor in shaping the destinies of Foundry Iron. Our monthly statistics show an increase in current make on March 1 over February 1 of about 5300 tons weekly. A partial stock report indicates an increase of 22,600 tons during February, which proves that while the demand is very heavy it is not yet capable of absorbing our whole product.

Pig Iron.—The market in New York continues in an unsettled condition, without any improvement in prices. We quote as follows: Northern brands, No. 1, $11 to $11.50; No. 2, $10.50 to $11; No. 2 Plain, $10 to $10.50. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.50; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

In Philadelphia the Pig Iron market has been dull and uninteresting all through the week. Sellers have been able to move a fair amount of material, but the best that could be done was to maintain last week's prices. There is a continued pressure to secure business, and the outlook for the immediate future is not encouraging. It will not take many days, however, to settle the question as to which way the market will move, but the market has got to move out of the rut before there can be anything like general activity. Prices for seaboard deliveries are about as follows, with the usual rebate according to freights at points within a radius of 100 miles south or west: No. 1 X Foundry, $11 75 to $12; No. 2 X Foundry, $10.75 to $11; No. 2 Plain, $10.40 to $10.50.

The demand for Pig Iron in Chicago shows no abatement and good business is continually coming up. Large inquiries are in the market for Foundry Iron, one of them calling for 3000 to 4000 tons. Good sales of local Coke Iron have been made. One house reports having had the largest week's tonnage for this year, notwithstanding higher prices are asked than for Southern. These transactions were not confined to a few large consumers, but buyers were quite numerous. The situation of the local manufacturers is now very strong, and they are inclined to advance quotations still further. The sales of Southern Coke may not have been quite so large as during the previous week, but they amounted to a very respectable tonnage. We quote for cash as follows:

Lake Superior Charcoal	$12.00 to $13.00
Local Coke Foundry, No 1	11.50 to 12.50
Local Coke Foundry, No. 2	11.00 to 12.00
Local Coke Foundry, No. 3	10.50 to 11.50
Local Scotch, No. 1	11.50 to 13.00
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.35 to 10.70
Southern Coke, No. 3	10.10 to 10.40
Southern, No. 1 Soft	10.85 to 11.00
Southern, No. 2 Soft	10.35 to 10.70

The market for Pig Iron in the Pittsburgh district has been quiet the past week, and aside from several sales of Bessemer Pig for March and April delivery very little has been done. The furnaces there are very firm in their views as to prices for second and third quarter. Foundry Irons continue very dull. We quote f.o.b. Pittsburgh, the rate from Valley being 65c.: No. 1 Foundry, $10.40 to

$10.50 ; No. 2 Foundry, $9.85 to $10; Bessemer, $10.30 to $10.40.

Cincinnati advices report that the market in Pig Iron for the past week has been rather unsatisfactory to all agents representing those Southern furnaces which are interested in the recent combination to maintain prices. About all the business that has been done on the $7.25 basis for No. 2 Foundry has been small orders running from carloads to 50 tons. There has been a good deal of Iron sold, however, by those furnaces not in the pool, and also by parties holding warrants. The outside furnaces are getting $7 for No. 2 Foundry. The warrant Iron is being sold on even a lower basis than this. But little business is expected during the coming week, but the probability is that after these outside companies have filled themselves, which will probably be in a week or so, business will resume its normal current. The deliveries are going on about as usual, and fair minded parties are quoted as regarding the market satisfactory and normal in the main. In Northern Irons the situation has been unchanged, and probably it may be truly said that the general situation, both as to North and South, is steadier than it has been. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.25 to 9.50
Southern Coke, No. 3	9.00 to 9.25
Southern Coke, No. 1 Soft	9.50 to 9.75
Southern Coke, No. 2 Soft	9.25 to 9.50
Southern Coke, Gray Forge	8.50 to 8.75
Southern Coke, Mottled	8.50 to 8.75
Ohio Silvery, No. 1	12.00 to 12.50
Ohio Silvery, No. 2	11.50 to 12.00
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00

The market in St. Louis continues without material change. There continues to be more or less weakness in prices and furnaces are apparently quite anxious for business; at least some of the prices which have been made would seem to indicate that their order books are quite bare. Sales during the week were not heavy, being confined largely to carload lots with an occasional sale of 100 to 200 ton lots. We quote as follows for cash, f.o.b. cars St. Louis :

Southern, No. 1 Foundry	$10.00 to $10.50
Southern, No. 2 Foundry	9.75 to 10.00
Southern, No. 3 Foundry	9.50 to 9.75
No. 1 Soft	9.75 to 10.00
No. 2 Soft	9.50 to 9.75

CHICAGO REPORT.

Scrap.—Cheap grades of Iron are in strong demand, but best grades are quiet. Metals are active. Yard dealers' buying prices are as follows, Chicago delivery :

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	7.50	....
Malleable Cast	6.50	....
Stove Plate (free of burnt)	5.50	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.50	....
Old Gas Pipe and Boiler Tubes	6.00	....
Cast Borings	3.50	....
Turnings	5.00	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	10¼c.
Copper Bottoms	....	9¼c.
Copper Clips	....	10 c.
Red Brass	....	8½c.
Yellow Brass	....	7½c.
Light Brass	....	5¼c.
Pipe Lead	....	3 c.
Tea Lead	....	3 c.
Zinc	....	3¼c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	..	1 c.

Anthracite.—Shippers have advanced the schedule 25 cents. Although the demand is light, the advance is well maintained. The prices of carload lots of 12 tons minimum are as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	7.00	7.25
Council Bluffs, Iowa	7.00	7.25
Lincoln, Neb	7.15	7.40
Sioux City, Iowa	7.50	7.75
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.00	7.25
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	7.00	7.25
Leavenworth, Kan.	7.00	7.25
Omaha, Neb	7.00	7.25

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

There continues to be an excellent volume of business in the West, reports indicating very satisfactory activity and a more liberal movement of goods than for several years at this season. In the East there is not the same improvement noticeable, but the market is feeling the effect of the increased demand from the interior and, on the whole, the indications are favorable for good business. The talk of war has doubtless had some effect in restraining enterprise and keeping back business. The failure thus far of the plans to consummate the consolidation of the Wire Rod interests has the effect of giving a slightly weaker tone to the products directly affected. In general, prices in Shelf and Heavy Hardware are unchanged and apparently awaiting a marked increase in the demand before taking a turn upward. Collections generally are satisfactory.

Advices from Chicago.—Spring trade in Shelf Hardware now seems to be in full tide of activity. The local jobbing houses found their orders on Monday of this week far in excess of anything known for many months. The demand for some kinds of goods is reported phenomenal. A very heavy business has been done in all kinds of Steel Goods and all sorts of Garden Tools. Some lines of House Furnishing Goods have also been called for so heavily as to test the capacity of the manufacturers. The movement of seasonable goods is beyond expectations. Bad roads are interfering with business in some sections of the West, but good drying weather has prevailed over other localities and consequently the general volume of business does not seriously feel the effect of this unfavorable influence. Heavy Hardware jobbers are also in receipt of a good trade, which covers all kinds of Wagon and Carriage Stock as well as Iron and Steel.

Advices from St. Louis.—The Hardware jobbing trade report a most excellent demand for all lines of goods and the present month promises to show a heavy increase over the corresponding month of last year. In Builders' Hardware a heavy business is reported and the amount of building throughout this section is enormous. Shelf Goods, Edge Tools, Files, &c., are selling very freely, particularly Files, which are being ordered in larger volume than for months past. Screws, Carriage and Machine Bolts, Corrugated Iron and Terne Plates are all good sellers just now. Prices are being well maintained, and in Barb and Plain Wire and Wire Nails advances have been made which are being firmly adhered to. The general conditions are excellent. Collections are excellent.

NOTES ON PRICES.

Wire Nails.—There has been no important change in the Wire Nail market and during the past week the volume of business was moderate, owing to the liberality with which orders were placed last month, prior to the advance which went into effect March 1, and also to the feeling of uncertainty that prevails in regard to the consummation of the plans for the consolidation of the Wire interests, the outcome of which is at least problematical. Notwithstanding the delay in the consummation of the plans and the serious difficulty which it is understood is being encountered, the market for Wire Nails continues fairly steady. New York quotations are on the basis of $1.70 to $1.75 for small lots from store.

Advices from Chicago.—The situation is rather uncertain and probably will be so until something definite is known concerning the proposed consolidation. Jobbers have enjoyed a good demand for small lots, but have not advanced their prices to correspond with the full rates named by manufacturers. Small lots from stock are quoted at $1.65, but all sellers have not adhered closely to this price. The Mississippi River jobbers are understood to have advanced their rates to $1.80 for small lots.

Advices from St. Louis.—The market is in a firm position. Jobbers report a heavy demand and quote $1.65 to $1.70, base, for small lots from store.

Cut Nails.—The Cut Nail market remains steady. Some efforts are being made by the manufacturers to work together so as to obtain a slightly higher figure in sympathy with the condition of the Wire Nail market. The price in New York is $1.25 to $1.30 for small lots from store.

Advices from Chicago.—The demand is very limited and the light trade moving is being done at the old price of $1.45 for small lots from stock.

Advices from St. Louis.—There is some improvement in the demand for Cut Nails, but prices are inclined to weakness. Jobbers ask $1.40 to $1.45, base, for small lots from store.

Barb Wire.—The Barb Wire market presents few new features. The trade are not disposed to buy freely at present, awaiting some definite outcome of the Wire Rod negotiations.

Advices from Chicago.—Manufacturers report absolutely no stock on hand and shipments from factory continuing very heavy on old contracts. The future of this branch of trade will, of course, depend on the result of the deliberations over the consolidation. Jobbers continue to quote small lots from stock at the same price as that asked by manufacturers for carload lots, and report a very good demand from the retail trade.

Advices from St. Louis.—The demand for Barb Wire is exceptionally heavy. Mills report a larger volume of business than for months past. Jobbers report a steady increase in the demand, and quote small lots at $1.70 for Painted and $2 for Galvanized.

The Peck, Stow & Wilcox Company. — Under date March 1 the Peck, Stow & Wilcox Company, Southington, Conn., and New York, have issued a discount sheet applying to their 1898 catalogue, reference to which is made in another column.

Glass.—Local demand for Window Glass continues limited. Jobbers at some of the Atlantic Coast points recently agreed to hold Window Glass in less than carload lots at 85 and 10 per cent. discount, a price which has been obtainable for some time past. This agreement, however, has not materially strengthened the market, as 85 and 15 per cent. discount is now given in some cases. Various rebates are to be allowed by the American Glass Company for different quantities of Glass purchased by April 1. This was supposed to indicate that advanced prices would go into effect at that time, but no announcement of higher prices has been made. Demand from factory is reported as being strong ; also that a number of jobbers are still holding off for lower prices.

White Lead.—The distribution has been in a jobbing way, covering immediate and nearby requirements. Prices and terms remain unchanged, with no indications of any upward or downward movement.

Red Lead.—Nothing outside of ordinary business is being done, but this is fair in amount, with prices steady for both domestic and foreign products.

Linseed Oil.—There is a very commonplace demand, jobbers being conservative in their purchases. Under ordinary circumstances present price of raw material would result in higher values, but outside competition is depressing the market to some extent.

Color Photography.

At a recent meeting of the Royal Photographic Society in London, Prof. Gabriel Lippman described his system of color photography, whereby a photograph showing the colors of nature is obtained by a direct process and with only one exposure of the plate. The film, which might be of any sensitive substance, he explained, was exposed, developed and fixed in the usual way. Two conditions, however, must be observed. The film must, in the first place, be transparent and grainless, and in the second it must be in contact with a metallic mirror during exposure. The effect of the mirror, which was formed by running a layer of mercury in behind the plate, was to reflect back the incident colored rays and thus make the incident light waves stationary. These stationary vibrations, falling in the interior of the sensitive film, impressed their own structure upon it, and by virtue of the structure thus imparted to it the brown deposit of silver, when viewed by reflected white light, appeared clothed with the same colors as were possessed by the image in the camera. The colors were produced by "interference" in the same way as those of the soap bubble or mother of pearl. That this was their cause M. Lippman said was proved by the fact that the tints of a negative changed if it were damped in consequence of the gelatine swelling slightly and thus altering the structure of the silver deposit. The colors produced by this process were true and bright, provided that exposure and development had been properly conducted. They were, moreover, completely fixed, and resisted the action of light and time. He had not yet succeeded in taking prints from his negatives, but was convinced that to do so would be found possible.

Luxfer Prisms as Fire Shields.—The use of Luxfer prisms for fire shields was tested publicly last week in Chicago. The prisms stood the effects of a hot fire and streams of cold water without breaking, and those who saw the experiment came to the conclusion they would be highly serviceable as fire screens in large warehouses and factories. Experiments along this line have been privately made for a number of weeks by the Luxfer people. About a dozen insurance men and manufacturers and Chief Swenie of the Fire Department witnessed the public exhibition. When the fire was hottest streams of water were turned on the glass, and while the prisms cracked none of them broke, and not even a splinter of glass fell from the frame work. This is thought to prove conclusively the serviceableness of the material for fire windows. It has the great advantage over fire shutters that the firemen can see through it and that in case of necessity it is easily and quickly broken.

In their advertisement elsewhere in this issue Follansbee Brothers Company, 328, 330 and 332 Second avenue, Pittsburgh, Pa., direct attention of the trade to Tinners' Tools and Machines. They state that they can furnish anything desired in this line, and at attractive prices. The inquiries of the trade are solicited.

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Metal and Miscellaneous Prices.

CHICAGO, MARCH 10, 1898.

Tin—

alts pigs.....15¾@16¢

American Tin Plates—

merican Base Box Quotations.

ased on 32,000 square inches in a box, ich is exactly 2 per cent. more than in English base box of 14 x 20 Tin tes. The American base box weighs ℔ and the English base box 108 ℔.

Highest Grade Charcoal—Bright.

ize.	Base.	Contents.	Per box.
x 14,	110-℔	...240 sheets	$5.65
"	140-℔	" "	7.25
x 12,	110-℔	" "	5.75
"	140-℔	" "	7.50
x 20,	110-℔	....120 "	5.65
"	140-℔	" "	7.25
"	160-℔	" "	8.85
"	180-℔	" "	10.45
"	200-℔	" "	13.15

x 28 double the price of 14 x 20.

x17,	140-℔	....120 sheets	5.35
"	180-℔	" "	6.95

Second Grade Charcoal—Bright.

x 14,	110-℔	....240 sheets	5.10
"	140-℔	" "	6.15
x 12,	110-℔	" "	5.25
"	140-℔	" "	6.30
x 20,	110-℔	....120 "	5.10
"	140-℔	" "	6.15
"	160-℔	" "	7.25

x 28 double the price of 14 x 20.

Highest Grade Coke—Bright.

x 20,	110-℔	....240 sheets	5.75
x 12,	110-℔	" "	4.15
"	140-℔	" "	4.95
x 20,	110-℔	....120 "	4.00
"	140-℔	" "	4.85

x 28 double the price of 14 x 20.

26½,	110-℔	....120 sheets	8.00
29½,	110-℔	" "	8.85
32½,	110-℔	" "	9.90
"	140-℔	" "	12.35
39½,	140-℔	" "	15.00

d English Method Quotations.

Charcoal Plates—Bright.

e price of 20 x 28 sizes is double the e of 14 x 20.

		Per box.
alland or leiyn rade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$5.25
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	6 75
	IXX, 14 x 20	8.25
	IXXX, 14 x 20	9.75
	IXXXX, 14 x 20	11.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.50
laway rade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	4.75
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
ssemer eel or ual to J. B. rade, Full elght.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	$3.75
	IC, 10 x 20	5.50
	IC, 17 x 17	7.75
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.00
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	4.50
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔	15¢
95 ℔	20¢
90 ℔	25¢
85 ℔	30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating	10.50@ 12.00
Worcester Grade, 12 to 14 lbs. coating	8.00@ 9.00
S T P / L Grade, 10 to 12 lbs. coating	7.50@ 8.00
Dean Grade, 8 to 10 lbs. coating	7.25@ 8.00

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00

	Per box of 56 sheets.
IX, 14 x 56	$12.50
IXX, 14 x 56	14.00
IX, 14 x 60	13.50
IXX, 14 x 60	15.00

Iron and Steel Sheets—

Black.

	Soft Steel.	Refined Iron.
Nos. 10 to 16	2.00¢	2.20¢
17 to 20	2 10¢	2.30¢
21 to 24	2.20¢	2.40¢
25 and 26	2.30¢	2.50¢
27	2.40¢	2.60¢

Russia, Planished, &c. 100 ℔.

Patent Planished, ℔, A... $10.20 } 5%
Patent Planished, ℔, B.... 9.20 } dls.
Craig's Polished Sheet Steel.....8½¢
U.S. Polished Sheet Steel No. 27 A 5.05¢

Galvanized.

First quality.....dis. 80@80&2½%

Copper—*Ingot.*

Lake..... 12¾@13¢
Casting Brands..... 12¼@12½¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing, (100 ℔ lots). (To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.08
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots ..... ℔, 40¢
100-℔ lots..... ℔, 36¢
No. 2 (guaranteed over 90% pure).
Small lots..... ℔, 34¢
100-℔ lots..... ℔, 33¢
Nickel Aluminum Casting Metal.
Small lots..... ℔, 39¢
100-℔ lots..... ℔, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots..... ℔, 35¢
100-℔ lots ..... ℔ 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter..... ℔, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter ..... ℔, 55¢
Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 ℔ or more. Less quantities, 5¢ ℔ additional.

Wider than	6-in.	14-in.	24-in.
And including.....	14-in.	16-in.	30-in.
	℔	℔	℔
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.40	.45
" 21 to 23.....	.42	.42	.47
" 24.....	.42	.44	.49
" 25.....	.43	.45	.50
" 26.....	.43	.46	.55
" 27.....	.44	.48	.58
" 28.....	.44	.50	.60
" 29.....	.45	.52	.65
" 30.....	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-℔ casks..... 5¾¢
300-℔ casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping ..... 9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8⅝¢

Lead—

Soft Pig Lead .....4¢
Bar.. .....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&10%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead Galvanized Lap Joint 80&25%
Double Bead Galvanized Slip Joint 80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized .....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne .....70&15%

Cutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.35
Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. .. ℔ square,	$4.75	$4.50
Galv..... ℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....℔ 2 ¢
" " Brown.....℔ 1½¢
" " Purple .....℔ 2½¢
" " Ground in oil, B. Red, ℔ 6½¢
" " Ground in oil, Red...℔ 6½¢
" " Ground in oil, Brown, ℔ 5½¢
" " Ground in oil, Purple, ℔ 6½¢
Linseed Oil, Boiled, in bbls.....43¢
Linseed Oil, Raw, in bbls.....41¢
Mineral Paints.....1 @ 5¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5½ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1¼ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal..... .34¢
Spirits Turpentine, in bbls., ℔ gal....40¢
Asphaltum, Trinidad Refined, ℔ ton.$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet.....$1.25
Roofing Pitch, ℔ bbl of 300 ℔.....$3.00

NEW YORK, MARCH 11.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₩ lb, 53¢
Aluminum Sheet, B. & S. gauge. In lots of 50 lbs or more.

	6-in.	14-in.	24-in.
Wider than.....	14-in	24-in.	30-in.
And including.....	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.56	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 8½¢
Hallett's.....₩ lb, 7¾@8¢
Japanese.....₩ lb, 7½@7¾¢

Brass—Planished.....net

Roll and Sheet.....35% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.
¼-in. up to 2-in.	$0.35
5/16-in. up to ¾-in.	.36
7/16-in. up to 5/8-in.	.38
9/16-in. up to ⅞-in.	.41
5-16-in. up to 1 in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3-in. and larger.	Special
2-in. to 3-in., to No. 19, inclusive.	.38

35% off.

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ lb 18½@19¢ basis
Ingot.
Lake.....12½¢
Ansonia Grade Casting.....11½¢
Planished.....net
Sheet and Bolt.....15¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....85%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₩ lb, 2.00....	2.25¢
Nos. 17 to 21.....	₩ lb, 2.10....	2.35¢
Nos. 22 to 24.....	₩ lb, 2.20....	2.45¢
Nos. 25 and 26...	₩ lb, 2.30....	2.55¢
No. 27.....	₩ lb, 2.40....	2.65¢
No. 28.....	₩ lb, 2.50....	2.75¢
American B. B.....₩ lb, 4¢		

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 10½@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ lb, A, 9½¢; B, 8½¢ net
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

Nos. 10 to 16.....	₩ lb, 12¢
Nos. 17 to 21.....	₩ lb, 13¢
Nos. 22 to 24.....	₩ lb, 14¢
Nos. 25 to 26.....	₩ lb, 15¢
No. 27.....	₩ lb, 16¢
No. 28.....	₩ lb, 17¢
No. 29.....	₩ lb, 19¢
No. 30.....	₩ lb, 21¢

40%
36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛@4¼¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....38¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb..... 6 ¢
Lead, Amn. White, in oil..... 6 ¢
Lead, Red, bbls. and ⅛ bbls..... 6 ¢
Lead, Red, kegs..... 6 ¢
Ochre, American..... 1½¢
Red Venetian, American..... 1¾¢
Linseed Oil:
Raw, ₩ gal.....45@46¢
Boiled.....47@48¢
Spirits Turpentine:
In bbls.....36¢
In cases.....44¢
Putty:
In barrels and ½ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5¼¢
Clarified.....₩ lb 5 ¢
Accra.....₩ lb 4¼¢
Half Jack.....₩ lb 4½¢
Cecilia.....₩ 100 lb $4.55
Choice Red.....₩ 100 lb 4.60
(*Spot Oil*, ⅛c. ₩ lb *higher.*)

Petroleum Products—

In Barrels (Barrel Included).

Stove Gasoline.....	₩ gal. 10@11¢
Kerosene.....	₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....75%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks 70@10%
Soldering Unions.....70%
" Nipples.....70@75%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves. 70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnam's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897..... 40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75%
Galvanized Iron Range Boilers above 52 gallon.....65%
N. B.—5 % extra on Standard 30, 35 and 40 gal. Boilers.
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gallon..70%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....60%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....60%
" " " Backs Plain.....60%
" " " " Galvanized....60%
" " " Legs Plain.....60%
" " " " Galvanized....60%
" " " Backs with air chambers, Plain.....60%
Cast Iron Sinks, Backs with air chambers Galvanized.....60%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.

Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.35
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₩ bbl.	$1.48@$1.49
Rosin, E. & F.....	₩ bbl.	1.55@ 1.60
Rosin, G. & H.....	₩ bbl.	1.70@ 1.80
Rosin, I. & K.....	₩ bbl.	1.85@ 1.90
Rosin, M. & N.....	₩ bbl.	2.10@ 2.20

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₩ sqr.....	$3.50@$4.50	
No. 1 Bangor Ribbon.....	3.00@ 3.25	
Pen Argyle, ₩ sqr.....	3.25@ 3.50	
Peach Bottom, ₩ sqr.....	4.75@ 5.60	
No. 1 Chapman, ₩ sqr....	3.00@ 4.25	
Lehigh Slates, ₩ sqr... ..	3.25@ 3.80	

Vermont:

Sea Green, ₩ sqr.....	$2.45@$3.05
Purple, ₩ sqr.....	3.75@ 4.00
Variegated Purple.....	2.25@ 2.90
Unfading Green, ₩ sqr...	3.50@ 4.00
Red, ₩ sqr.....	8.50@10.50

Solder and Soldering Fluids— Solder—

⅛&¼ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f.o.b. New York.
In barrels. ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....8½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb.....4¢
5% dis.

Yager's Soldering Salts.
½ lb bottles, each.....80
Large quantities, ₩ lb.....40

Soldering Coppers—

Per lb.....15¢@16¢ net

Spelter—

Western Spelter.....4½@4.60
Bertha (pure).....7@7½

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15½¢
Straits, pigs, lb.....14¾@15¼¢
Straits, in bars, ₩ lb.....16¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.25
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	10¢
95 lb	15¢
90 lb	20¢
85 lb	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating.....	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating.....	8.00 @ 9.25
STP Grade, 10 to 12 lb coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1½¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke,	IC,	14 x 20..... $4.25
	IX,	14 x 20..... 5.25

Terne Plates—

Worcester Grade,	IC,	14 x 20..... 4.25
		20 x 28..... 8.50
Dean Grade,	IC,	14 x 20..... 4.00
		20 x 28..... 8.00
Gilbertson's Old Method,	IC,	14 x 20.. 7.50
		20 x 28.. 15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 189 .

1¼ and less, Plain....57&10&10&10&10%
1¼ and less, Galv. 50&10&10&10&10%
1½ and larger, Plain..67&10&10&10%
1½ and larger, Galv..55&10&10&10&10%
Screw and Socket Joint Casing.....65%
Inserted Joint Casing.....60%
Boiler Tubes, 2¼ inch and smaller.72½%
" 2½ inch and larger 75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb.....6¼¢

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Wood Co., W. Dewees..... 76
Zucker & Levett & Loeb Co.. 25

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Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

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American Corrugating Co., St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
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Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Northrop, H. S., 40 Cherry St., N. Y.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Chafing Dishes.
Hill, Whitney & Wood Co., Boston, Mass.

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Peck, Bros. & Co., New Haven, Conn.
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Rochester Stamping Works, Rochester, N. Y.

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National Pipe Bending Co., New Haven, Conn.

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Berger Bros. Co., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N.Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.

Conductor Pipe Machinery.
Poorman Mfg Co., Piqua, O.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.

Cork Pullers.
Arcade Mfg. Co., Freeport, Ill.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. *(See Pipe Couplers.)*

Covering, Pipe and Boiler.
Johns, H. W. Mfg. Co., 100 William St., N. Y.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs, Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Selner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, Ohio.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Berger Bros. Co., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dumb Waiters.
Energy Mfg. Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Hangers.
Baker, J. R. & Sons Co., Kendallville, Ind.
Berger Mfg. Co., Canton, O.
Chautauqua Hanger Co., Mayville, N. Y.

Elbows.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co, Windsor, Conn.
Hanson & VanWinkle Co., Newark, N.J.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

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Eddy Electric Mfg. Co., Windsor, Conn.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

Enamel.
Sanitary Mfg. & Enamel Co., Muncie, Ind.

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Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

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Koven, L. O. & Bro., 18 Spruce St., N. Y.

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Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

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Johns, H. W. Mfg. Co., 100 William St., N. Y.

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Troy Nickel Works, Troy, N. Y.

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Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

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Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Carton Furnace Co., Utica, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Giblin & Co., Utica, N.Y.
Graff & Co., 208 Water St., N. Y.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Pease, J. F., F'ce Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Ct.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N.Y.
Tubular Heating & Ventilating Co., Phila., Pa.
Wheeler, Russel & Son, Utica, N. Y.

Furnaces, Plumbers' and Tinners'.
Burgess Soldering Furnace Co., Columbus, Ohio.
White Mfg. Co., Syracuse, N. Y.

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Keen & Hagerty Mfg. Co., Baltimore, Md.
Shepard, Sidney & Co., Buffalo, N. Y.

Gas Heaters. *(See Stoves and Ranges, Gas.)*

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Colt, J. B. & Co., 115-117 Nassau St., N. Y.
Kent, C. M. Mfg. Co., Baltimore, Md.
Wilson, F. Cortez & Co., Chicago, Ill.

Gas Mantles.
Tucker & Koester, 116th St. and East River, N. Y.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grates.
Jackson, W. Sons, 246 Front St., N. Y.

Gutter Formers.
Whelan, Dennis, J., Troy, N. Y.

Hammocks.
Palmer, I. E., Middletown, Ct.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N.Y.

Heaters, Steam and Hot Water.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 96 Liberty St., New York.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Howard Furnace Co., Syracuse, N. Y.
Kellogg-Mackay-Cameron Co., Chicago, Ill.
Magee Furnace Co., Boston, Mass.
Mitchell Heater Co., Poughkeepsie, N.Y.
Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
Pease, J. F., F'ce Co., Syracuse, N. Y.
Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam, Conn.
Richmond Stove Co., Norwich, Conn.
Rockford Grate Co., Chicago, Ill.
Smith Co., H. B., 135 Centre St., N. Y.
Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

Hollow Ware.
Griswold Mfg. Co., Erie, Pa.
Kieckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

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Illinois Pure Aluminum Co., Lemont, Ill.

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Dover Stamping Co., Boston, Mass.
Parks & Parks, Troy, N. Y.

Hydraulic Rams.
Hanson, F. B., 175 Centre St., N. Y.

Iron, Galvanized Sheet. *(See Sheets, Galvanized.)*

Iron, Kalameined.
Republic Iron works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet. *(See Sheets, Iron and Steel.)*

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Kitchen Specialties.
Dover Stamping Co., Boston, Mass.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Schratwiesers Metal Lath Works.

Lavatories.
Wheeler, E. S. & Co., New Haven, Ct.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. *(See Ceilings, Metallic.)*

Mica.
Munsell, Eugene & Co., 218 Water St., New York.

Milk Cans.
Kieckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
Shepard, Sidney & Co., Buffalo, N. Y.

Molding Frames.
Acme Machine Co., Cincinnati, O.

Nickel Plating Outfits.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Upham, Ely C., 35 Dey St., N. Y.
Zucker & Levett & Loeb Co., 526-530 W. 25th St., New York.

Oil Heaters. *(See Stoves and Ranges, Oil, Vapor and Gasoline.)*

Ovens, Portable.
Franke, H., Cleveland, Ohio.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Patterns.
Cope, Geo. W., Detroit, Mich.
Gobelile Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pipe Fitter and Crimper.
Blumer, Doscher Mfg. Co., Brooklyn, N. Y.

Pipe Joint Grease.
Dixon, Jos. Crucible Co., Jersey City, N. J.

Pipe, Water and Gas.
Millar, C. & Son, Utica, N. Y.

Plumbers' Tools, Specialties and Supplies.
Barstow Stove Co., Providence, R. I.
Colwell Lead Co., 63 Centre St., N. Y.
Crawford & Young, Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
Landers, Frary & Clark, New Britain, Conn.
National Pipe Bending Co., New Haven, Conn.
Peck Bros. & Co., New Haven, Conn.
Porsch, John, Erie, Pa.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wheeler, E. S. & Co., New Haven, Ct.
Wilson, R. M. Mfg. Co., Rome, N. Y.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Adriance Mach. Works, Brooklyn, N.Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.
West Mfg. Co., Buffalo, N. Y.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Steam and Hot Water.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.

Range Boilers.
Koven, L. O. & Bro., 18 Spruce St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Bowen Mfg. Co., Fond du Lac, Wis.
Gurney Refrigerator Co., Fond du Lac, Wis.
Northern Refrigerator Co., Grand Rapids, Mich.

Registers.
Excelsior Steel Furnace Co., Chicago, Ill.
Highton, Wm. & Sons, Boston, Mass.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.

Roofing Edger.
Bell, W. C., Syracuse, N. Y.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N.Y.
Burton, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Phila. Steel Roofing Co., Phila., Pa.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Pocock, O., Cincinnati, O.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N.Y.

Roofing Seamers.
Burritt, O. W. & Bro., Weedsport, N.Y.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N.Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scrantou, Pa.

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Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Acme Machine Co., Cincinnati, O.
Adriance Mach. Works, Brooklyn, N.Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Poorman Mfg. Co., Piqua, O.

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Miner & Peck Mfg. Co., New Haven, Coun.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pocock, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, Ohio.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co. Brooklyn, N. Y.
Toledo Mach. & Tool Co., Toledo, O.
West Mfg. Co., Buffalo, N. Y.
Whelan, Dennis J., Troy, N Y.

Sheet Metal Work.

Willis Mfg. Co., Galesburg, Ill.

Sheets, Iron and Steel.

Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Sheets, Galvanized.

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn. Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.

Berger Mfg. Co., Canton, O.
Burden, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Iron City Mfg. Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.
Thorn Shingle & Ornament Co., Philadelphia, Pa.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Skylights.

Rasner & Dinger, Pittsburgh, Pa.

Slaters' Tools.

Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.

Whelan, Dennis J., Troy, N. Y.

Snow Guards.

Halliday, M., East 9th St., N. Y.

Solder.

Bruce & Cook, 186 to 190 Water St., N. Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.

Burgess Soldering Furnace Co., Columbus, Ohio.

Speaking Tubes and Whistles.

Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties, Sheet Metal.

Vogel, Wm. & Bros., Brooklyn, N. Y.

Stamped Ware, Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.

Steam and Gas Fitters' Supplies.

Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 18th St., N. Y.

Steel Stamps and Stencil Dies.

Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.

Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.

Hoffman, Geo. W., Indianapolis, Ind.

Stove Patterns.

Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros. Co., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Collars.

Paxton Hdw. Co., Paxton, Ill.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.

Parks & Parks, Troy, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.

Arcade Mfg. Co., Freeport, Ill.
Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stoves and Ranges.

Beckwith, P. D., Est. of, Dowagiac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Graff & Co., 208 Water St., N. Y.
Magee Furnace Co., Boston, Mass
Phillips & Clark Stove Co., Geneva, N. Y.
Portsmouth Stove & Range Co., Portsmouth, O.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Sheppard, Isaac A. & Co., Phila., Pa.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.
White-Warner Co., Taunton, Mass.

Stoves and Ranges, Gas.

Griswold Mfg. Co., Erie, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Cleveland Foundry Co., Cleveland, O.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.

Tea Kettles.

Hill-Whitney & Wood Co., Boston, Mass.
Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

Tinners' Tools, Machines and Supplies.

Berger, L. D., Philadelphia, Pa.
Berger Bros. Co., Phila., Pa
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher, A. F. & Co., 31 Fulton St., N. Y.
Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

Tinners' Trimmings.

Vogel, Wm. & Bros. Brooklyn, N. Y.

Tin Plate. (*Mfrs. of.*)

Ætna Standard Iron & Steel Co., Bridgeport, O.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
Berger, L. D., Philadelphia, Pa.
Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Ellwood Tin Plate Co., Ellwood City, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

Tinware.

Dover Stamping Co. Boston, Mass.
Keen & Hagerty Mfg. Co., Baltimore, Md.
Kleckhefer Bros. Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.

Curtis & Curtis, Bridgeport, Conn.
Saunders', D. Sons, Yonkers, N. Y.

Valves.

Eastwood Wire Mfg. Co., Belleville, N. J.
Goodrich, Judson A. Co., 120 Beekman St., N. Y.
Jenkins Bros., 71 John St., New York.

Ventilators and Chimney Caps.

Canton Steel Roofing Co., Canton, O.
Globe Ventilator Co., Troy, N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Washburne, E. G. & Co., 46 Cortlandt St., New York.

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Keen & Hagerty Mfg. Co., Baltimore, Md.

Washers, Valves, &c.

Littleford Bros., Cincinnati, O.
Marston, I. G. & Co., Boston, Mass.

Water Closets.

Colwell Lead Co., 63 Centre St., N. Y.
Kelly, Thos. & Bros., Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Heaters.

Kemp, C. M. Mfg. Co., Baltimore, Md.

Wind Gates.

Miner & Peck Mfg. Co., New Haven, Ct.

Wiping Cloths.

Porsch, John, Erie, Pa.

SEE ALPHABETICAL INDEX, PAGE 57.

THE METAL WORKER.

With which is Incorporated The Stove and Tin Trade Journal, The Sheet Metal Builder, and Metal.

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First-class CORNICE MAKERS and TIN ROOFERS. Currie Hardware Company, 1216-1218 Atlantic avenue, Atlantic City, N. J. March 12

A man with good executive ability, who has had experience in a large stamped ware factory, where tin and steel ware for enameling are made, and a large number of hands are employed; one accustomed to supervising the making of machinery and dies, and capable of superintending; must be temperate; state age, experience, salary; applications will be treated as confidential. Address "Stamped Ware," office of *The Metal Worker*, 232-238 William street, New York City. March 12

A TINSMITH on assortment work in tin factory; to board with employer; a Catholic sober, single young man with some knowledge of plumbing. M. Mond, Ozone Park, L. I., N. Y. March 12

Experienced HOLLOW WARE MOLDER, as assistant foreman; also PATTERN MAKER in steel. "Hollow," office of *The Metal Worker*, 232-238 William street, New York City. March 12

A good reliable man capable at first-class work at either tinning or plumbing; married man preferred; steady job. Box 23 Aurora, N. Y. March 12

A FOUNDRY FOREMAN for a gray iron shop employing 60 molders, about half of whom are bench molders and the remainder floor molders; in reply give age, experience, recent employers and ability for turning out work cheaply. "V. V.," office of *The Metal Worker*, 232-238 William street, New York. Mar. 5

At once, several good SHEET METAL WORKERS. Address, with particulars, U. S. Head-Light Company, Utica, N. Y. Mar. 5

A SALESMAN in New York City, now visiting the building trade in the interests of hot water and steam goods; to also handle a very marketable line of ranges; new goods just brought out. "Western," office of *The Metal Worker*, 232-238 William street, New York City. Mar. 5

A young single man who has served an apprenticeship at the tinners' trade, and who understands something about working in a hardware store; must give recommendations as to honesty and speak English and German; steady job to right man; must be a hustler. G. B. Lahr, Juda, Wis. Mar. 5

SALESMAN thoroughly acquainted with tin plate and metal trade, by New York wholesale house. Address, giving references and experience, "Competent," office of *The Metal Worker*, 232-238 William street, New York City. Mar. 5

An A1 PLUMBER, TINNER, STEAM and HOT WATER FITTER; must be perfectly temperate and must have first-class references; state wages; to the right man steady work. P. E. Fraleigh, Red Hook, N. Y. Mar. 5

A first-class TINNER at inside and outside work; must understand bicycle repairing, wood and iron pump, wind mill work; also be able to clerk in store if required; none but first-class men need apply. Apply with references and wages wanted. Howell & Co., Woodhull, Ill. Mar. 5

SITUATIONS WANTED.

By PLUMBER and GAS FITTER, city or country; first-class mechanic; wages moderate. Albert Dorer, 491 Tenth avenue, New York City. March 12

By PLUMBER of 12 years' experience; steady employment solicited; can give estimates on plumbing and steam fitting. Geo. A. Wyckoff & Co., Elmira, N. Y. March 12

By first-class all round TINNER of 20 years' experience; considerable knowledge of plumbing and hot water heating; within 200 miles of St. Louis preferred. P. O. Box 81, Edwardsville, Ill. March 12

BOOKKEEPER, 35 years of age; experience in slate and slate roofing business; good estimator and cashier, energetic; highest references, bond. Leidenroth, 983 Myrtle avenue, Brooklyn, N. Y. March 12

By a first-class PATTERN FILER and REPAIRER; some experience at stove pattern fitting; a steady, sober man, well recommended. Frank Brando, 231 Congress street East, Detroit, Mich. March 12

By a TINSMITH; 12 years' experience in the tin and hardware business; can do inside and outside work; also stove and range work; some knowledge of plumbing and pipe work; steady position; sober and reliable; references furnished. "Tinsmith," Lock Box V., Prattsville, N. Y. March 12

As WATER WORKS SUPERINTENDENT in town of about 6000 or 8000 inhabitants by young married man; best of reference; can do anything from station to office; South or West preferred. "C. E. H.," office of *The Metal Worker*, 232-238 William street, New York City. March 12

By a first-class PLUMBER, GAS and HOT WATER FITTER; trade school graduate; neat lead and brass worker; strictly temperate; used to city and country work. A. J. Plumber, 2421 Sixth avenue, Troy, N. Y. March 12

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As CLERK by a young man 18 years old; two years' experience as clerk in a hardware store; can give best of reference from last employer; wages moderate. Lock Box 5, Almond, N. Y. March 12

By a PLUMBER, STEAM and HOT WATER FITTER; some knowledge of tinning; 12 years' experience in city and country; married; sober and reliable; reasonable wages; best of reference. Box 276, Mount Carmel, Pa. March 12

By a TINSMITH; a middle-aged workman thoroughly experienced in all branches of country work; practical hot air, water and steam heating systems; good reference; very reasonable arrangements for immediate and permanent employment. "Tinsmith," care of Chas. C. Proffitt, 38 Bleecker street, New York City. March 12

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By TIN and SHEET IRON WORKER; 20 years' experience; roofing and furnace work; steady work desired at $2.50 per day. John Shey, 74 Madison street, New York City. March 12

A practical man will be open for engagement as SALESMAN and DRAFTSMAN for a New York heating house by April 1. "A. B. C., No. 312," office of *The Metal Worker*, 232-238 William street, New York City. March 12

As CLERK in hardware store; understand bicycle repairing; 12 years' experience in a large retail hardware house; 31 years of age; can speak the Scandinavian language; A1 reference. Lew Matson, Clearlake, La. March 12

As TINNER by a good, steady, sober man 24 years of age; four years' experience; inside and outside work; country town preferred; married. C. A. Wilson, 68 Ash street, Ludlow, Ky. March 12

Steady position by a young man who is a good PLUMBER at new jobbing work, iron pipe, leader, stove and furnace work, steam fitting and bicycle repairing; single, sober and honest; 14 years' experience; wages $2.25 per day; city or country. "Janitor," 113 Nassau street, New York City. March 12

A young man who has spent five years in stove factory as PAYMASTER and PURCHASING AGENT would like to secure position with some other factory; can furnish best of reference. "J. S.," office of *The Metal Worker*, 232-238 William street, New York City. March 12

As PLUMBER, by young man 22 years of age, single; two and a half years' experience in country; best of reference; strictly temperate; New Hampshire preferred. W. Emerson, South Pittsfield, N. H. March 12

By a man with 16 years' experience in management of stove foundries as SUPERINTENDENT; thoroughly competent to assume entire management of all departments of a stove foundry; a practical molder; understands modern cupola practice and can handle help to advantage; highest references furnished as to character and ability. "Foundry Superintendent," office of *The Metal Worker*, 232-238 William street, New York City. March 12

By a young man as TINNER; five and a half years' experience at inside and outside work; willing to work for moderate wages for a steady job; reference as to honesty and ability. Box 75, Montezuma, Ohio. March 12

Young man 18 years old would like to learn plumber's trade; can give the best of references. S. I. Dayton, Center Moriches, L. I., N. Y. March 12

By a young man 24 years of age, who has had two years' experience at tinning, more outside than inside work; desires to finish trade; can set up all kinds of farm machinery, repair wind engines, pumps and bicycles; good references; wages moderate; can speak German and English. "H. H. K.," Box 263, Greenspring, Ohio. March 12

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By a TINSMITH and good jobbing PLUMBER; city or country. H. Rose, care H. Bloom, 87 Prince street, Boston, Mass. March 12

By a TINSMITH; expereinced on furnace work, general jobbing and plumbing repairs; country town south or west of Boston preferred. "Tinsmith, 8 Pembroke street, Somerville, Mass. March 12

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By a young man, who has some knowledge of plumbing, with a first-class shop, where he can finish trade; can hustle, where honest efforts are appreciated. "Hustler," 1118 Third avenue, New York City. March 12

By a good all around TINSMITH; also a good plumber; city or country. Harry Rosenbloom, 152 East Broadway, New York City. Mar. 5

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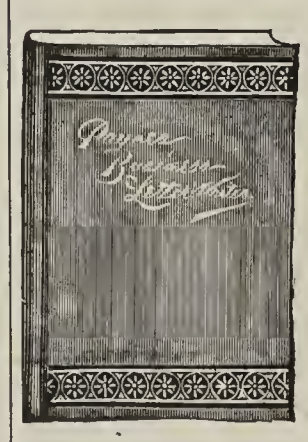
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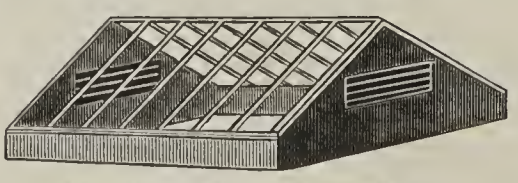
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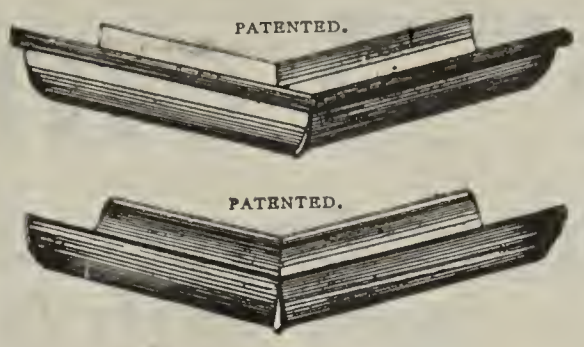
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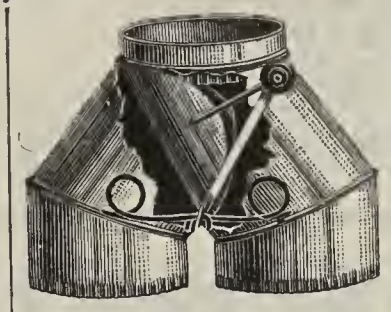
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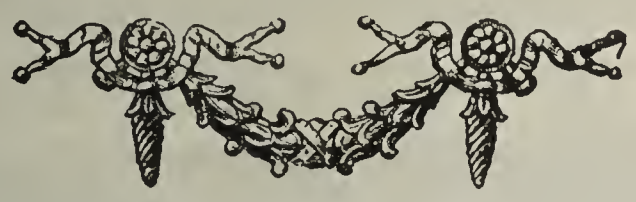
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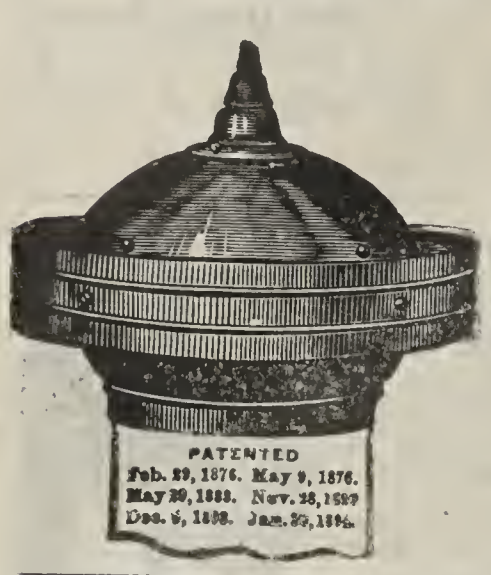
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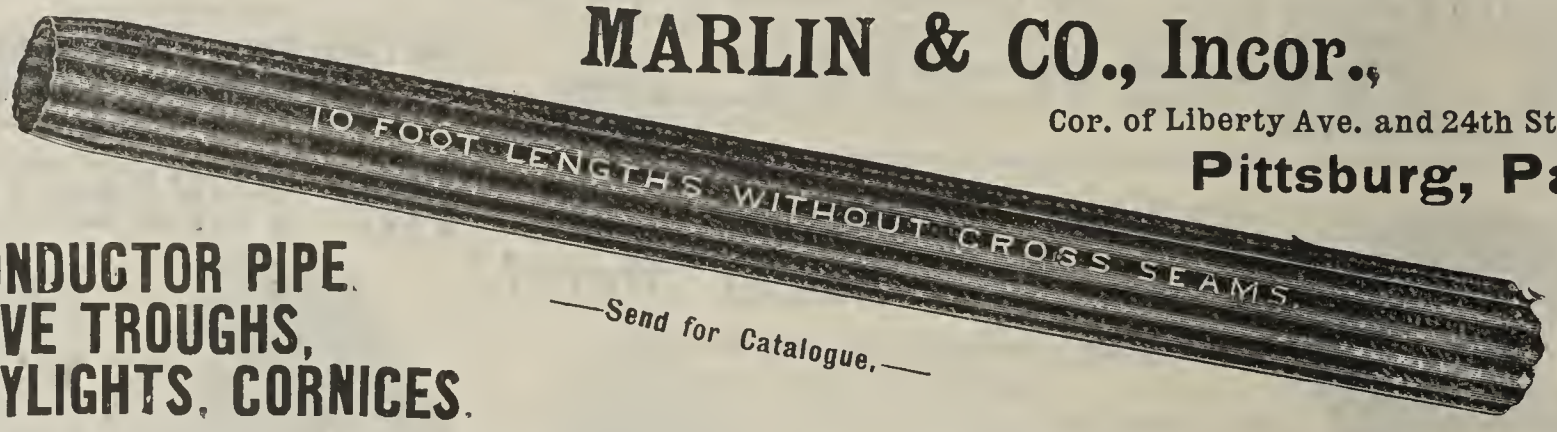
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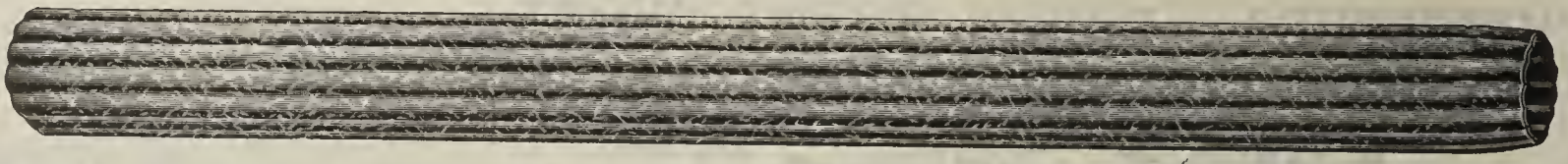
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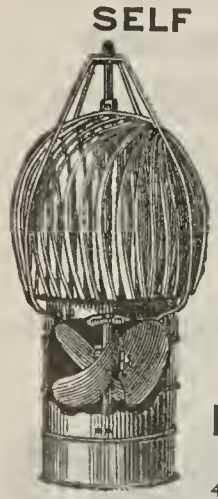
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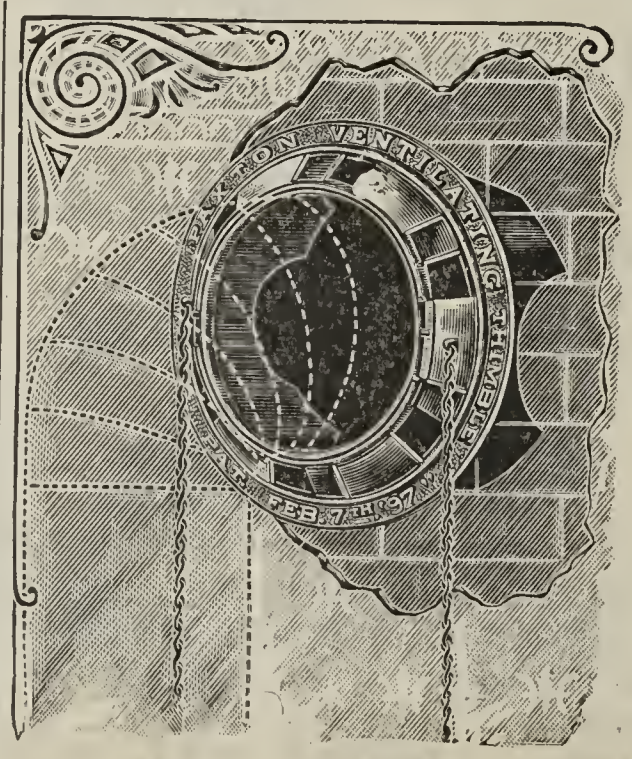
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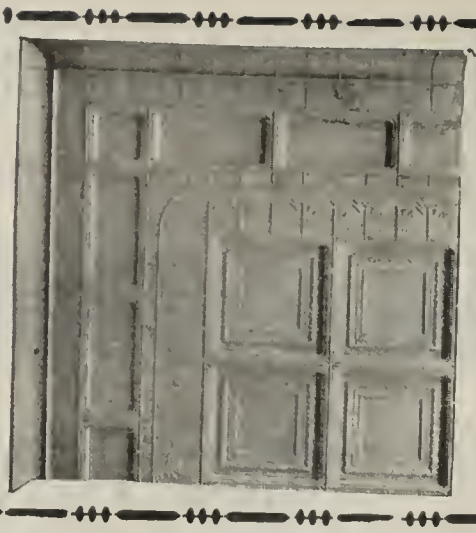
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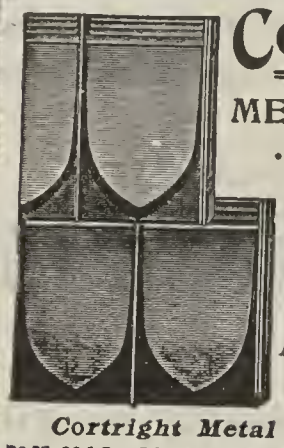
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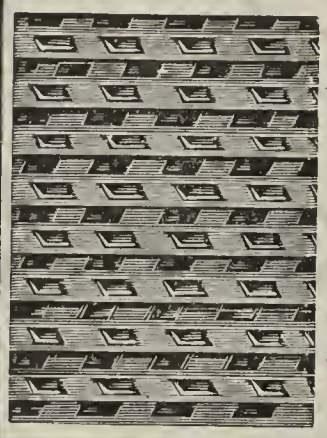
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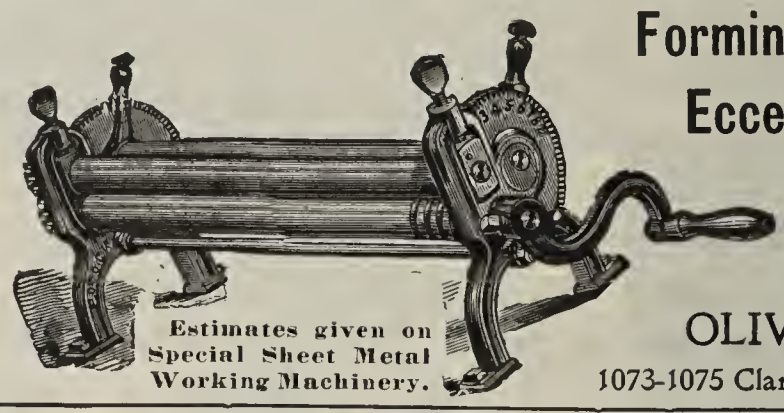
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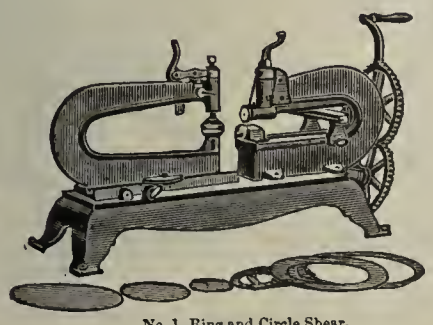
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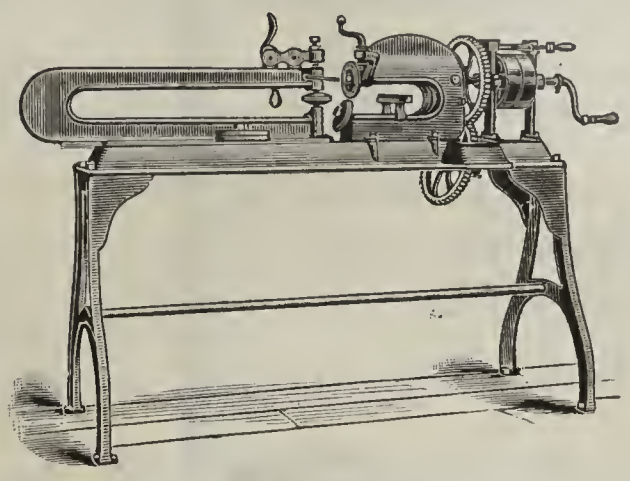
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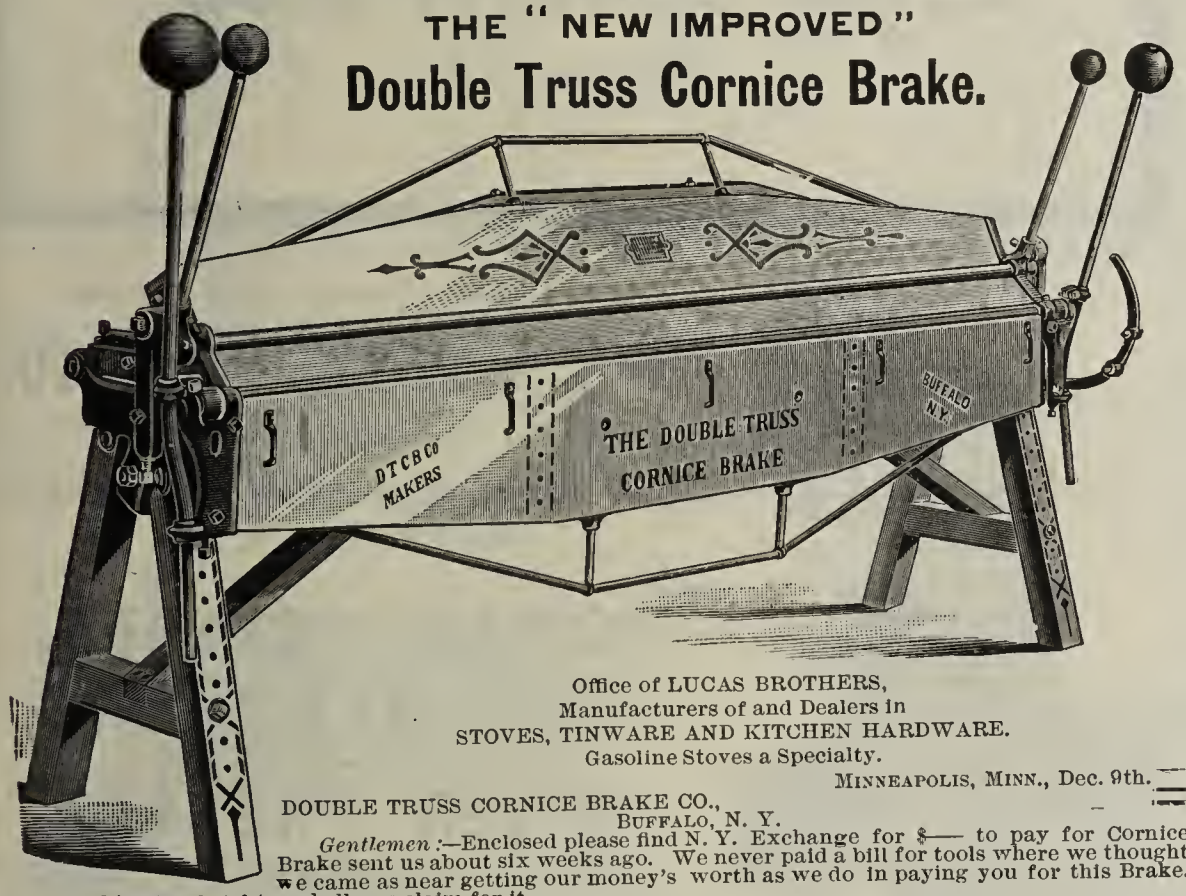
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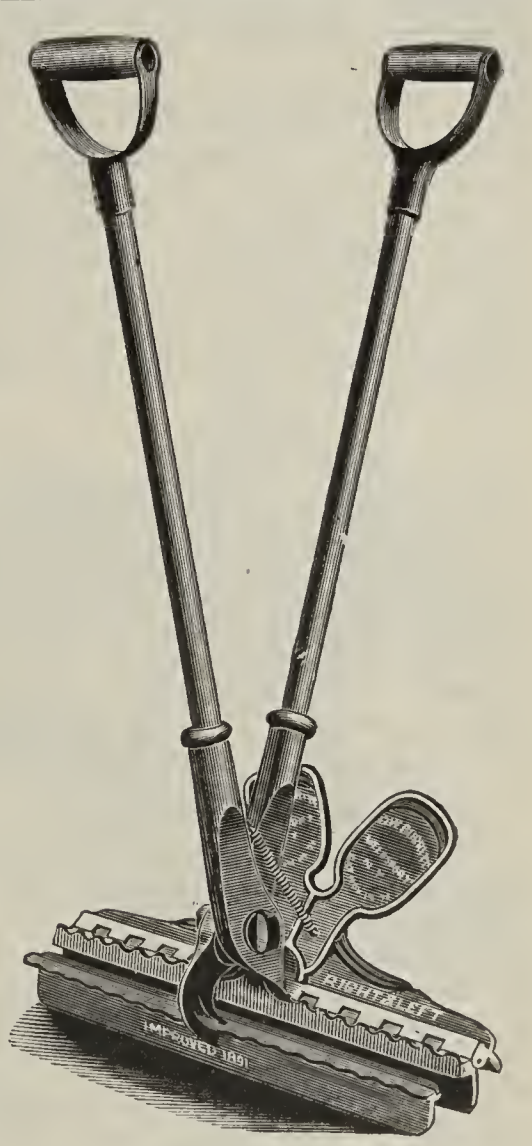
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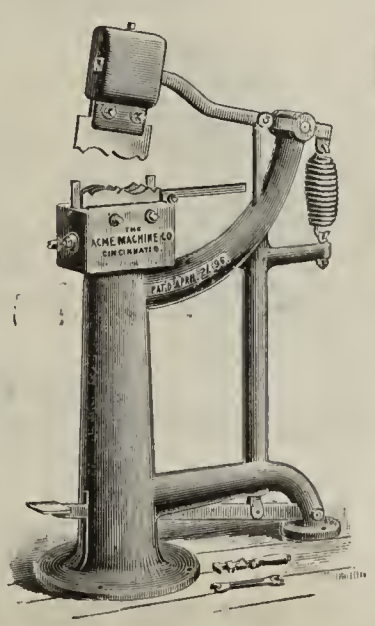
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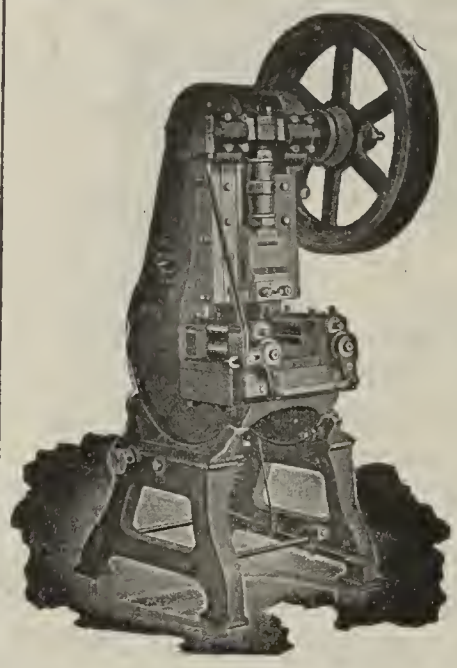
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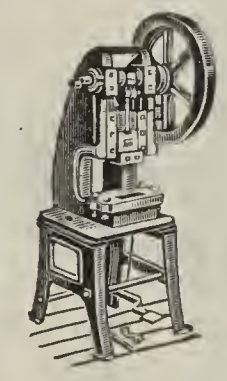
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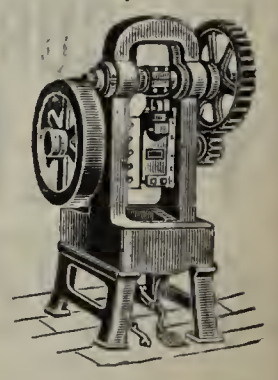
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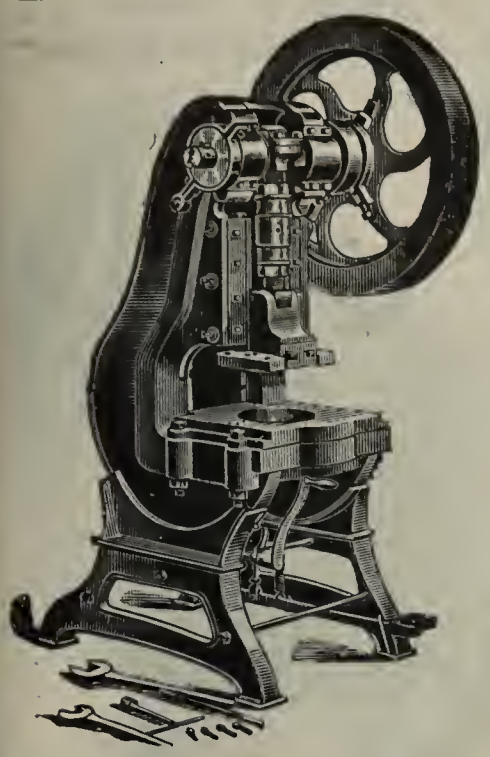
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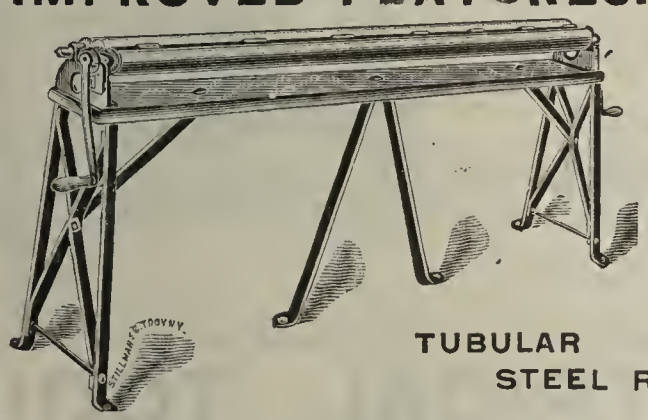
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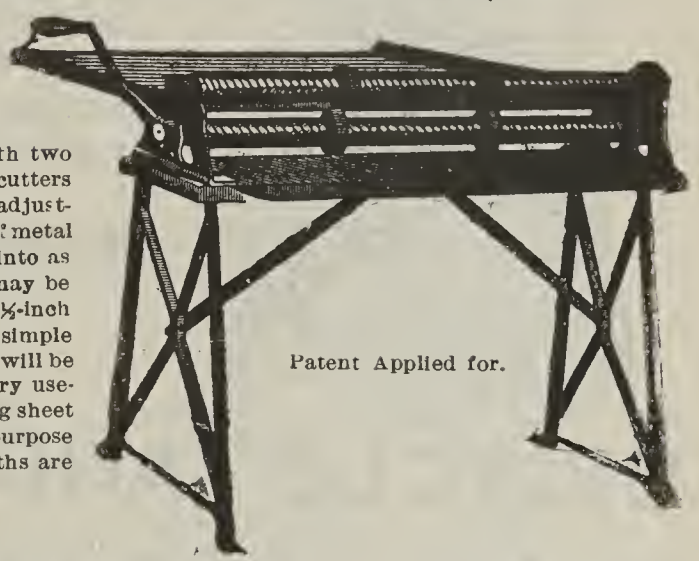
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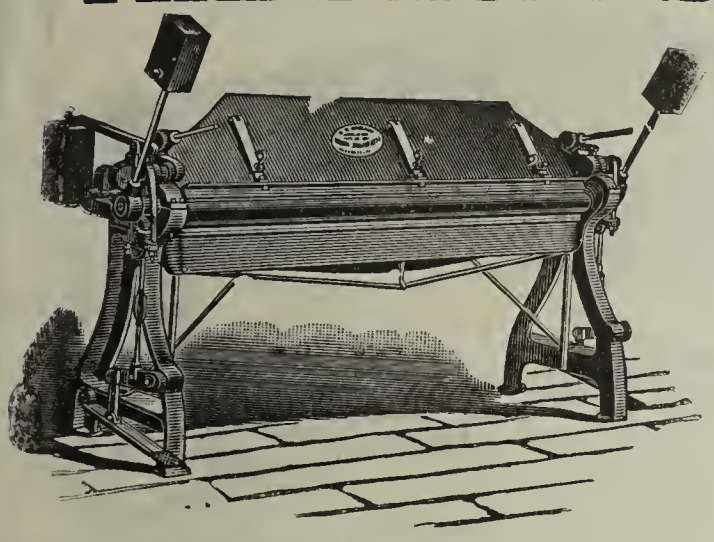
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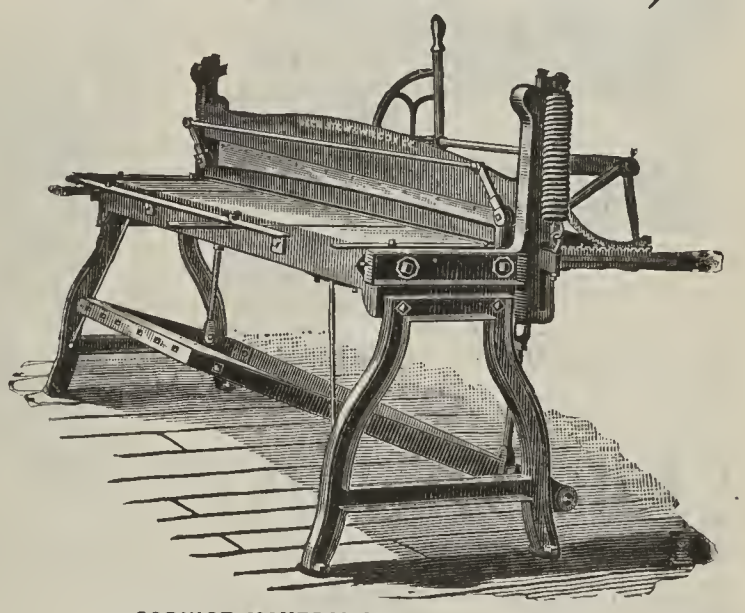
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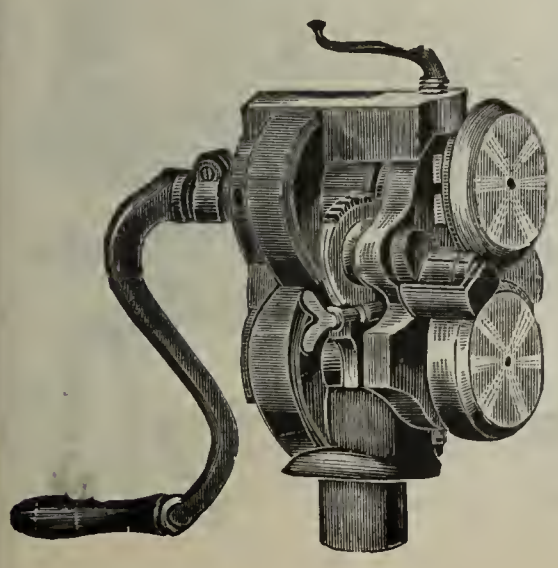
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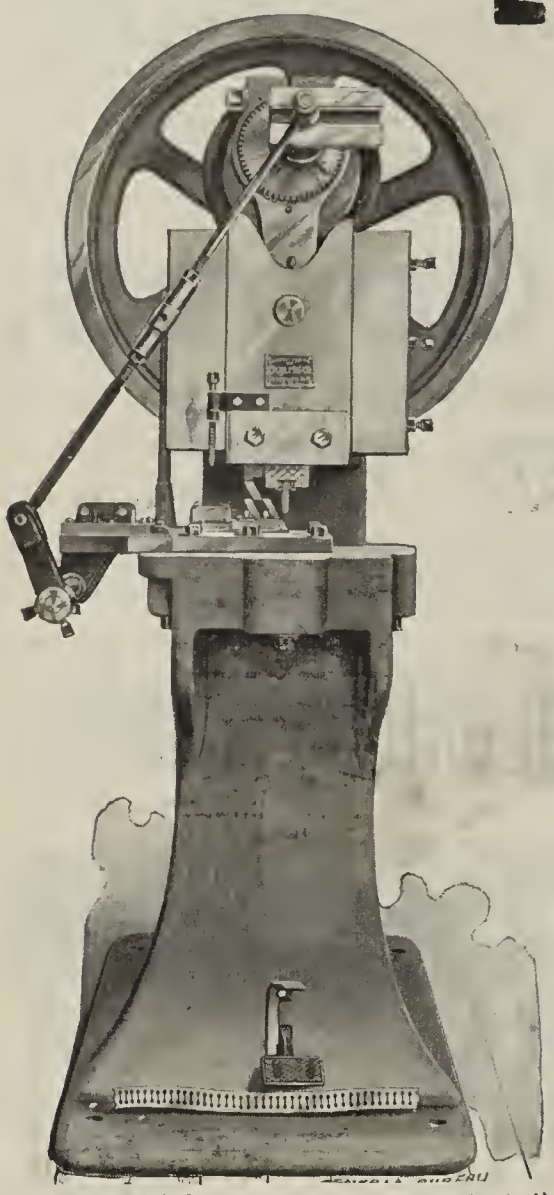
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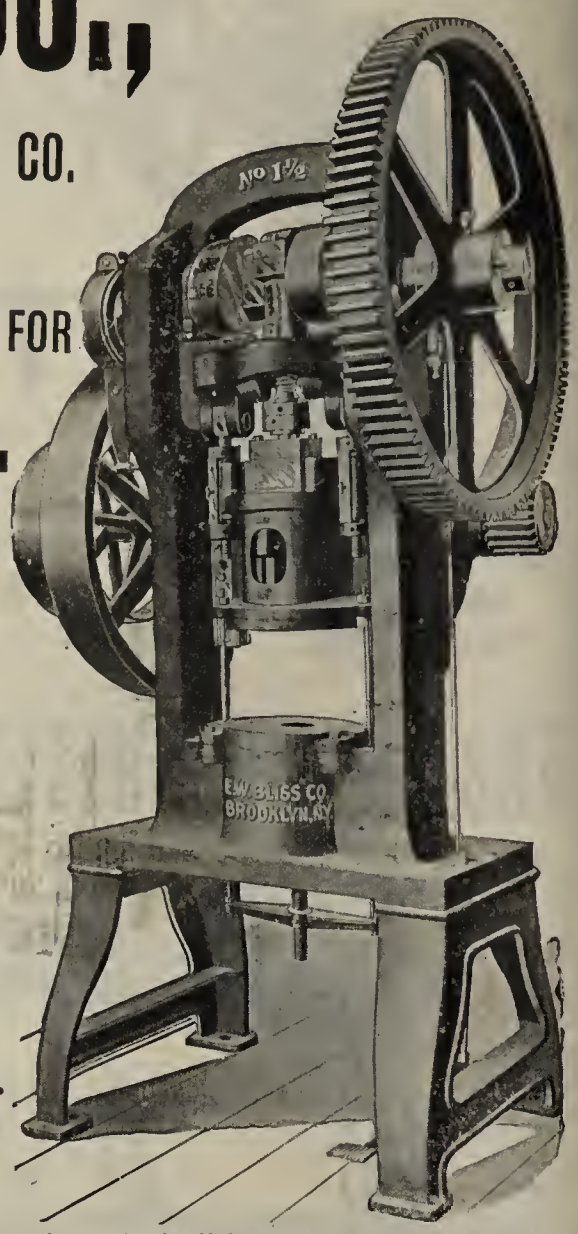
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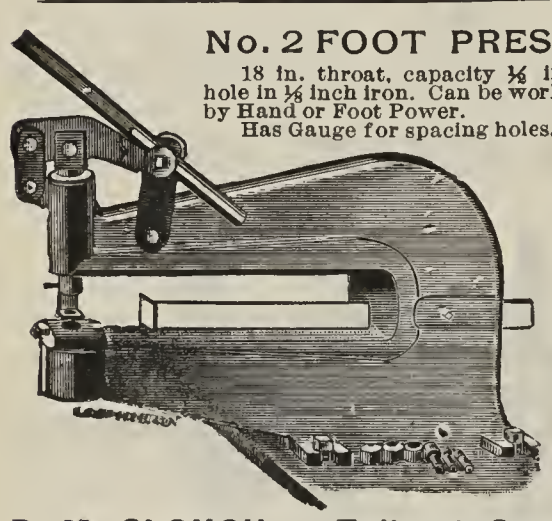


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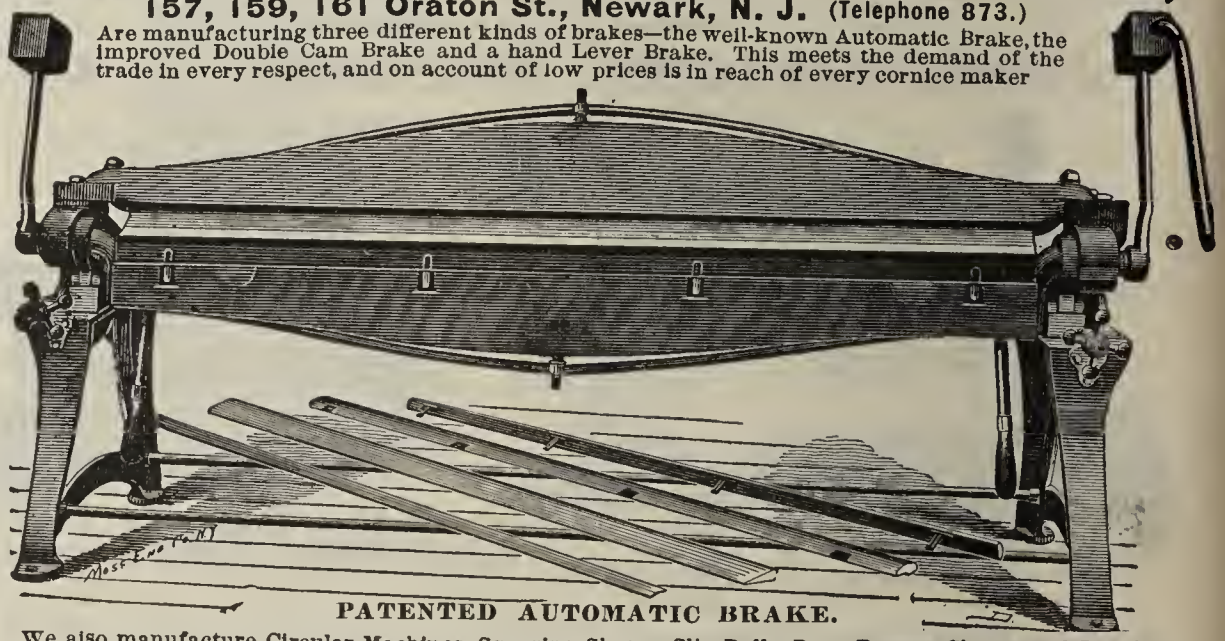
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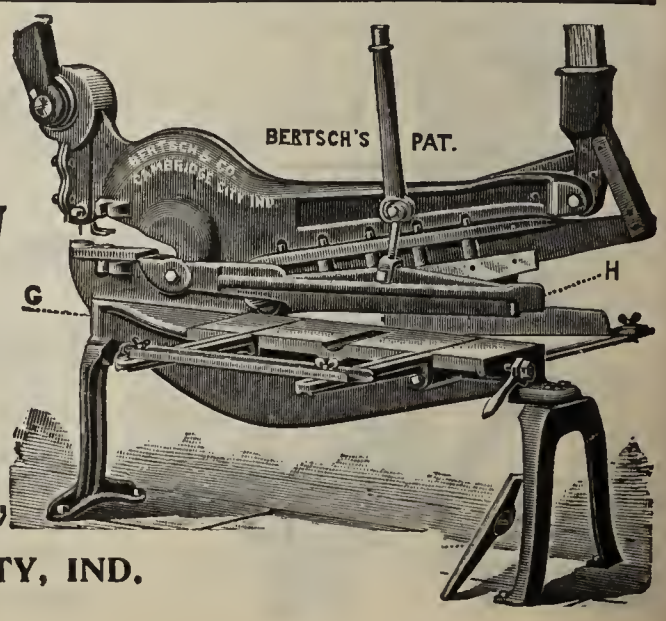
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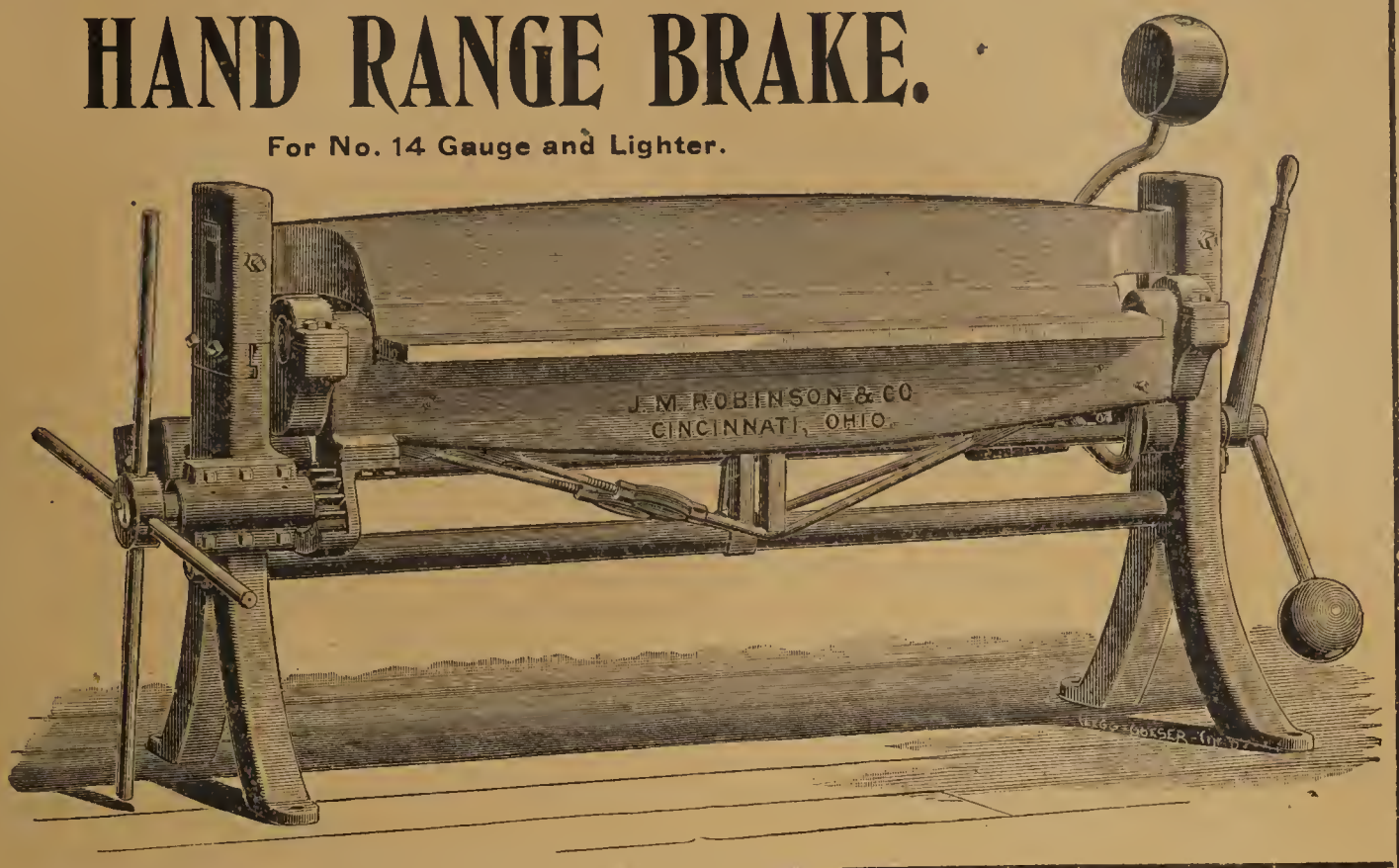
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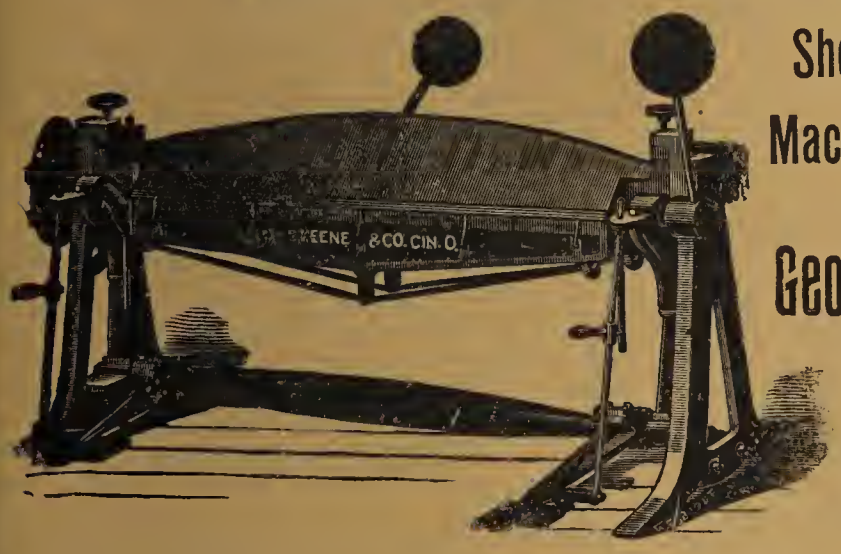
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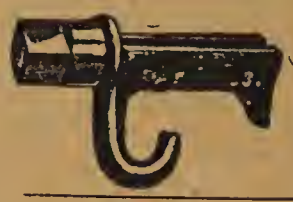
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A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

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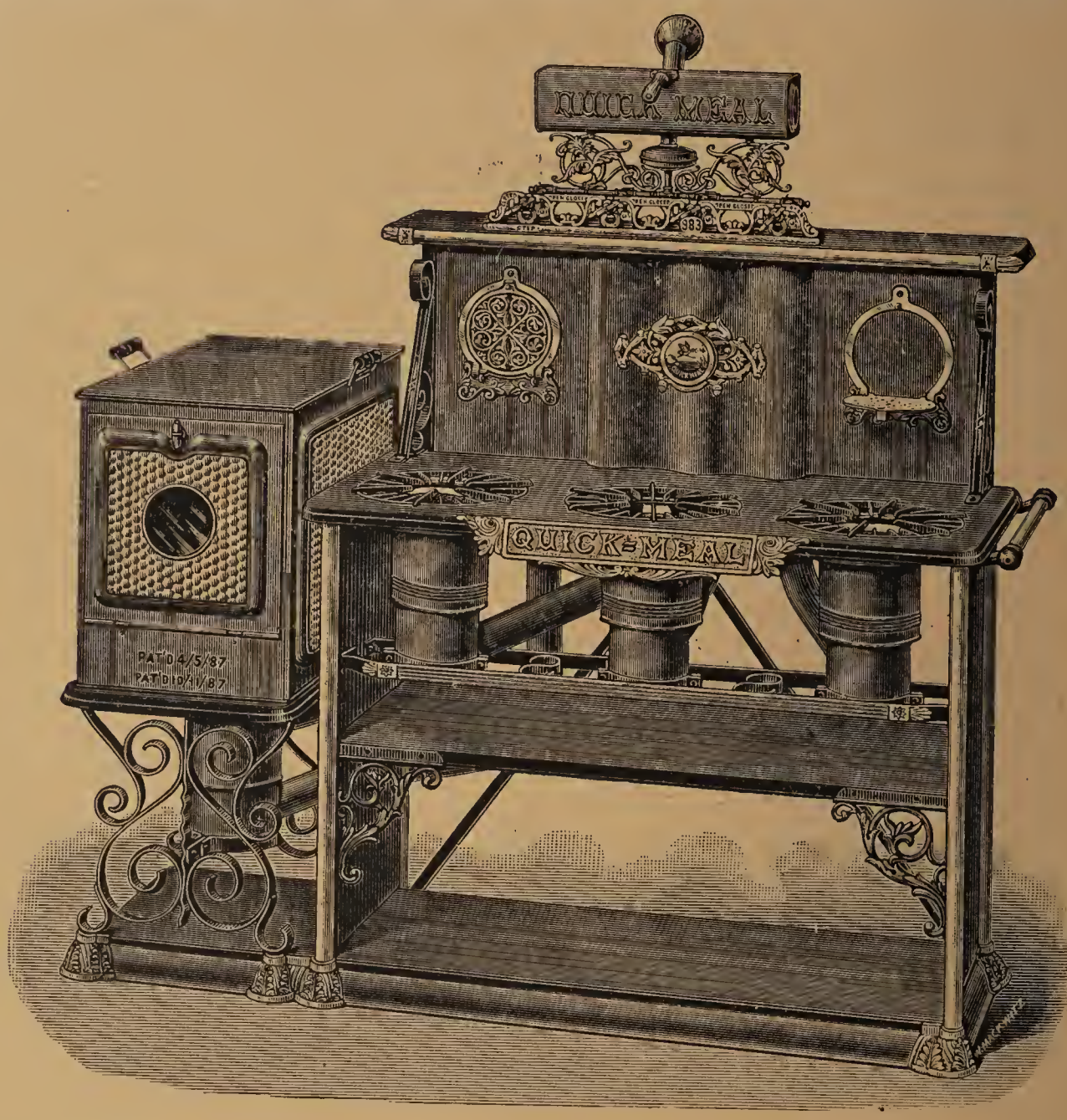
JENKINS BROTHERS, New York, Philadelphia, Chicago, Boston.

THE MAGEE CATALOGUE
Shows a complete line of cooking and heating apparatus.
SEND FOR A COPY.
MAGEE FURNACE CO., Boston, Mass.

QUICK MEAL QUICK MEAL QUICK MEAL QUICK MEAL THAT'S WHAT THEY ARE. QUICK MEAL QUICK MEAL QUICK MEAL QUICK MEAL

QUICK MEAL

GASOLINE STOVES.



A strong and distinctive feature of the "Quick Meal" is **Simplicity**. Simple in Construction—simple in Operation—simple in Explanation. No intricate and complex parts for "talking points."

Simplicity made the "Quick Meal" famous, made it popular, and made it sell and stay sold. Dealers everywhere appreciate this, and the enormous sales of "Quick Meal" stoves amply prove it.

The "Quick Meal" always satisfies every demand made upon it. That's why the users in over a half-million homes are unanimous in declaring it "The Recognized Standard of Excellence."

THAT'S WHAT THEY ARE.

CORRESPONDENCE SOLICITED IN UNOCCUPIED TERRITORY.

"QUICK MEAL" STEEL RANGES { Present the most attractive appearance. Answer the most practical purpose.

RINGEN STOVE Co. SAINT LOUIS

Carton

Hot Water & Steam Boilers & Furnaces.

This man can hardly believe he is using such a

SMALL AMOUNT OF FUEL,

and this letter is a practical illustration of the benefits derived from the large amount of

DIRECT FIRE SURFACE

which is a peculiarity in the construction of

THIS FURNACE.



READ!!!

CARTER FILTER COMPANY,
LOCKPORT, N. Y., Feb. 25, 1898.

CARTON FURNACE CO.,

Gentlemen:—I feel it my **duty** to write you relative to the **merits** of **your** furnace. Mr. Moran placed one in my residence (**28-inch fire-pot size**) last year and it does seem as if I was **stretching it a little** when I say that **2 SHOVELS** of **coal** and **SMALL ONES** at that (I am referring to the **small ash shovel** you send with your furnaces) heated my house of **11 large rooms** and **2 large halls** to 75 degrees the **coldest days** we have had this winter. All I have to do is to bank the fire at night, shake it in the morning, and **no more coal until the next night.** I have never let the check draft down only when putting on fresh coal and have never opened the front draft in the ash-pit door. This heater is the most **remarkably economical** heater I have **ever seen or heard of.** This heater could not consume less coal unless it consumed **none at all.** The heater in every other respect is **equally satisfactory.**

Yours respectfully,
FRANK C. FARNELL.

Send for our GOLDEN JUBILEE FURNACE CATALOGUE.

1847-1898.

If Interested in Steam and Water Boilers—we make a most complete line, and you should send for our Boiler Catalogue and Prices.

CARTON FURNACE CO.,

Makers of Heating Apparatus for over *50* *Years,*

UTICA, N. Y.

ECONOMY

J. F. PEASE FURNACE CO.

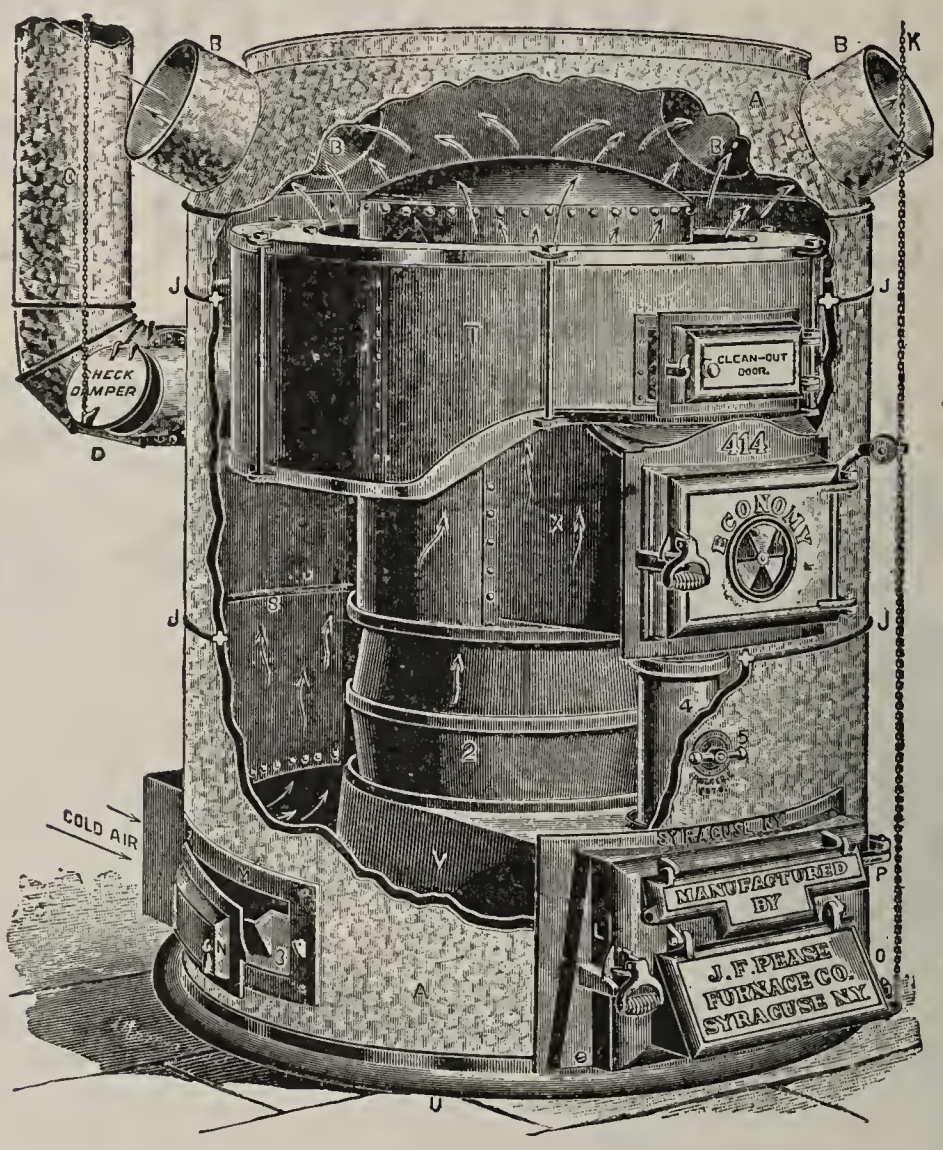
ECONOMY

WE SHALL MAKE AND SELL IN 1898

9 Distinct Patterns of Furnaces

In Portable Form (and 5 for Brick Setting), making 14 Patterns in all, in addition to a large line of

Combinations, Steam and Water Heaters.



1895 PATTERN—HARD COAL.

We shall have **TWO NEW TYPES** of **FURNACES** ready for the trade this month.

Our line now embraces every style and type necessary for Hard or Soft Coal, Coke, Gas, Wood or Lignite. Constructions thoroughly tested—some very low heights—with 3 Patterns of Grates—with and without Perfected Air Blast Appliances—Steel or Cast Iron—Prices rising from low to reasonable—every Furnace with a handsome Nickel Regulator.

We invite the inquiry of Dealers who desire to sell a line suitable to all requirements. Prices are right.

J. F. PEASE FURNACE CO.,

SYRACUSE, N. Y.

No. 86 E. Lake St., CHICAGO. 44 Centre St., NEW YORK.

SYRACUSE, N.Y.



RUSSEL WHEELER & SON
Wheeler
TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.

We have heaters adapted to all sections of the country and for all kinds of fuel—Hard or Soft Coal, Coke or Natural Gas, etc.

Tell us your needs and we will do our best to fit you out.

Only recently a man in the West Indies wanted of us a furnace to burn dried cocoanut husks.

THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,
REAL ESTATE,
HATBORO, PA.

TUESDAY AND FRIDAY,
221 SOUTH FIFTH STREET,
PHILADELPHIA.

HATBORO, PA., Dec. 26th, 1896.

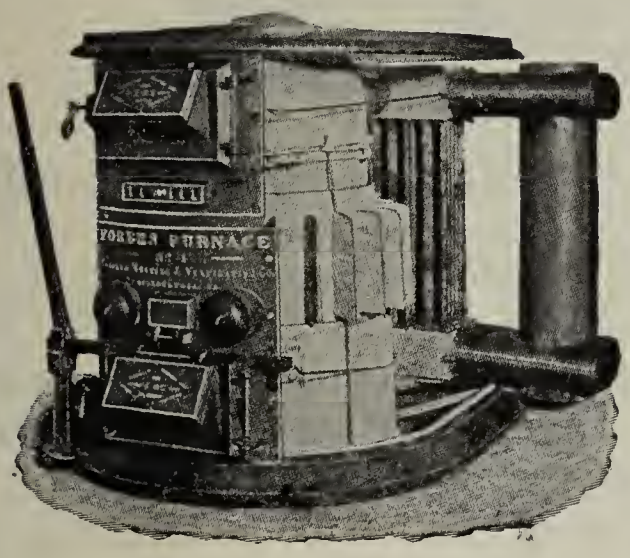
MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.

MY DEAR SIR :

In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal.

Very truly,
I. N. EVANS.

SEND FOR CATALOGUE



COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

☞ Only 4 feet 3 inches high in the Largest Sizes.

. . . LOW PRICE . . .

TUBULAR HEATING AND VENTILATING COMPANY,

228 QUARRY STREET, PHILADELPHIA.

DO NOT SPECULATE

IN

Cheap or Experimental

LINES OF

Vapor or Oil Cooking Stoves.



The average mortal has troubles enough of his own without buying those of his neighbor.

Speculation in any of the above mentioned lines will drain your purse and put you to a world of trouble.

Seeds of prudence now well sown in the selection of a line that is both complete and honest will yield a profitable and happy harvest. A good beginning for 1898 means half the battle won.

If you are interested in the handsomest line made, write for our catalogue.

EXCLUSIVE AGENCIES GIVEN.

THE SCHNEIDER & TRENKAMP CO.,

CHICAGO, ILLINOIS. CLEVELAND, OHIO.

Little Bobbie—"My mother
Daughters of the American Revolut
Little Eddie—"My ma's got a chainless bike."
Cleveland Leader.

The poorly built wheel squeaks for itself.
The American Cyclist.

Eng Mag
The Mfr

1/5 | Thursday
January 5
5—360

The Monarch Line And The Successful Merchant.

The successful merchant is he who studies his business minutely and recognizes the important fact that his stock should consist of such goods as are widely different from "the other fellow's" as can be secured, picks out a line that is progressive, up-to-date and superior as to special features, then gets them in early, does not get woozy about liberally displaying a complete assortment so as to impress his trade with the confidence that he possesses, familiarizes himself with every detail of construction, sets a good fair price and sticks to it, talks quality and does not scatter his fire all along the line.

Five minutes of good strong talk will bring profits. Don't buy goods because they are cheap, but seek for merit only. Hundreds of merchants have adopted this course in pushing **MONARCH** Vapor stoves and **MONARCH** Asbestos-Lined Ovens, and are reaping the benefit thereby; but there are still hundreds who have not even got the book that tells the story of **MONARCH** goods, and hence do not know what they are like.



The Monarch Stove & Mfg. Co.,

MANSFIELD, OHIO.

DISTRIBUTING AGENCIES:

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THE HALL BROS. CO.,
Lincoln, Neb.
KIECHLE, BRENTANO & CO.,
Evansville, Ind.
G. W. CAHOON,
St. Paul, Minn.
GEO. HAW & CO.,
Ottumwa, Ia.

BLUE FLAME OIL STOVE LEADERS

FOR 1898.

WE LEAD AND OTHERS FOLLOW.



For Durability and Simplicity our Blue Flame Wick and Wickless Stoves are recognized as the best in the market.



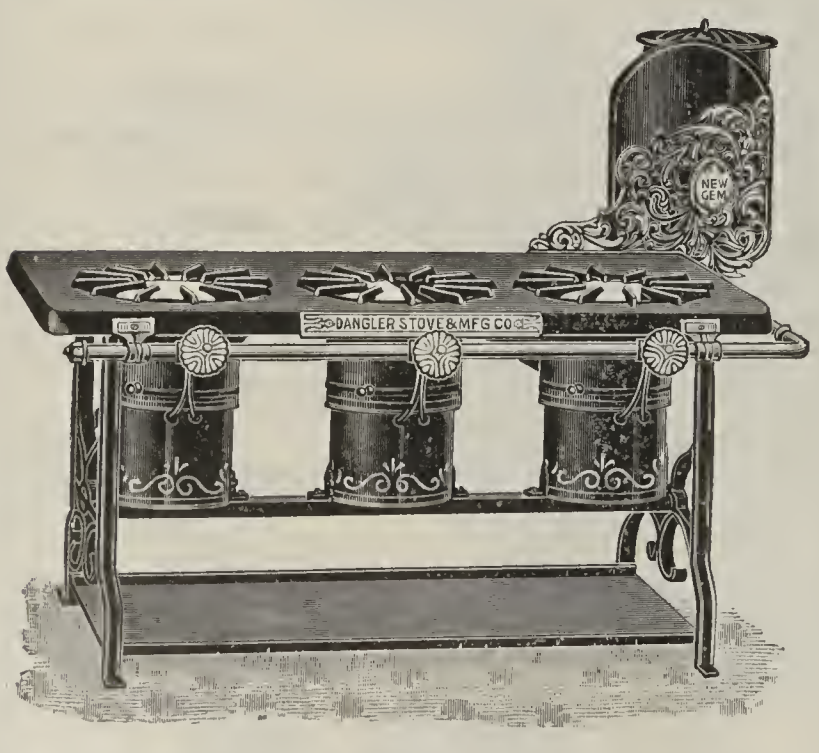
WICKLESS.

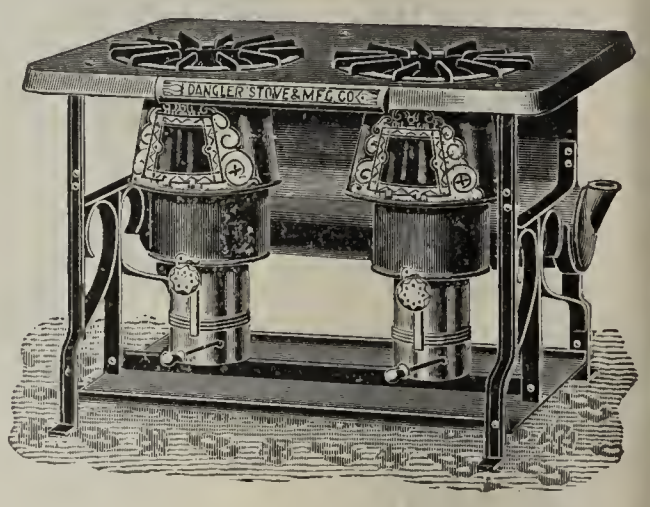
Made in seven different styles. Convenient in construction ; economical in the consumption of oil ; made with our Double Feed ; German Silver points ; no rusting or clogging ; with valve-stop and regulator ; heavy brass chimneys. Made for service and not for show. High back swinging shelf ; removable tank ; stove on rollers ; easy to operate and to clean.

A STOVE FOR THE PEOPLE.

WICK.

Our celebrated Blue Flame Wick Stoves are made in seven different styles, and are now in use in more than fifty thousand households in the United States, who bear willing testimony to their great merits. Artistic in design, handsome in appearance, and powerful in operation.





Our line of Gasoline, Vapor and Evaporating Ranges, Stoves, etc., as usual, is perfect and complete. Send for Catalogue.

THE DANGLER STOVE & MFG. CO., - Cleveland, Ohio.



THIS AIR TIGHT ROUND OAK RANGE

Ought to last:
and do good work
for forty years:

It is fitted so perfectly that surprising little fuel does the work—hence there is but little—if any wear. It will last.

It is therefore a good specialty to build up an enduring trade on.

It will do most perfect work.

It will always be made on honor.

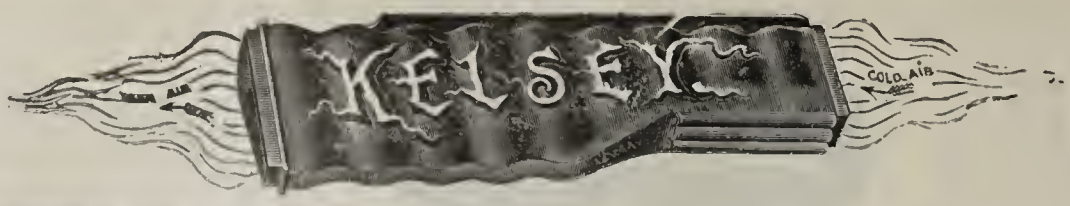
It is a proven success.

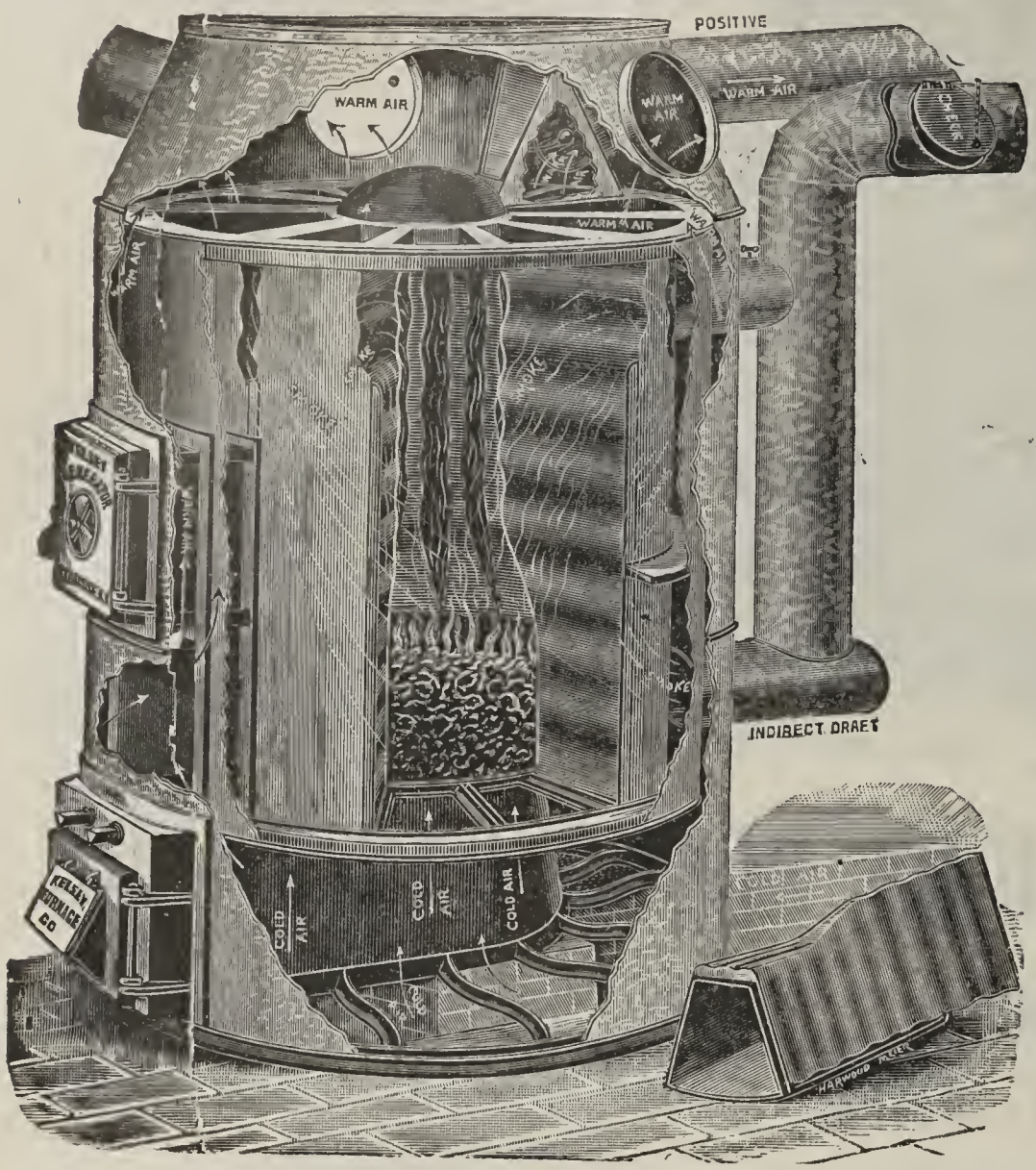
We want its merits known.

We solicit inquiry from dealers who can see profit and enduring business in a range fitted the ROUND OAK way.

Send for booklet.

Estate of P. D. Beckwith, Dowagiac, Mich.





WARM-AIR GENERATORS

PLEASE DEALERS

BECAUSE

They Afford a Specialty,

AND

ARE NOT SOLD

To Compete in Price with

HOT AIR FURNACES.

For catalogue and prices write

KELSEY FURNACE CO.,

SYRACUSE, N. Y.

COOK & VAN EVERA CO.,
173 Lake Street, Chicago, Ills.
239 Water Street, New York City.

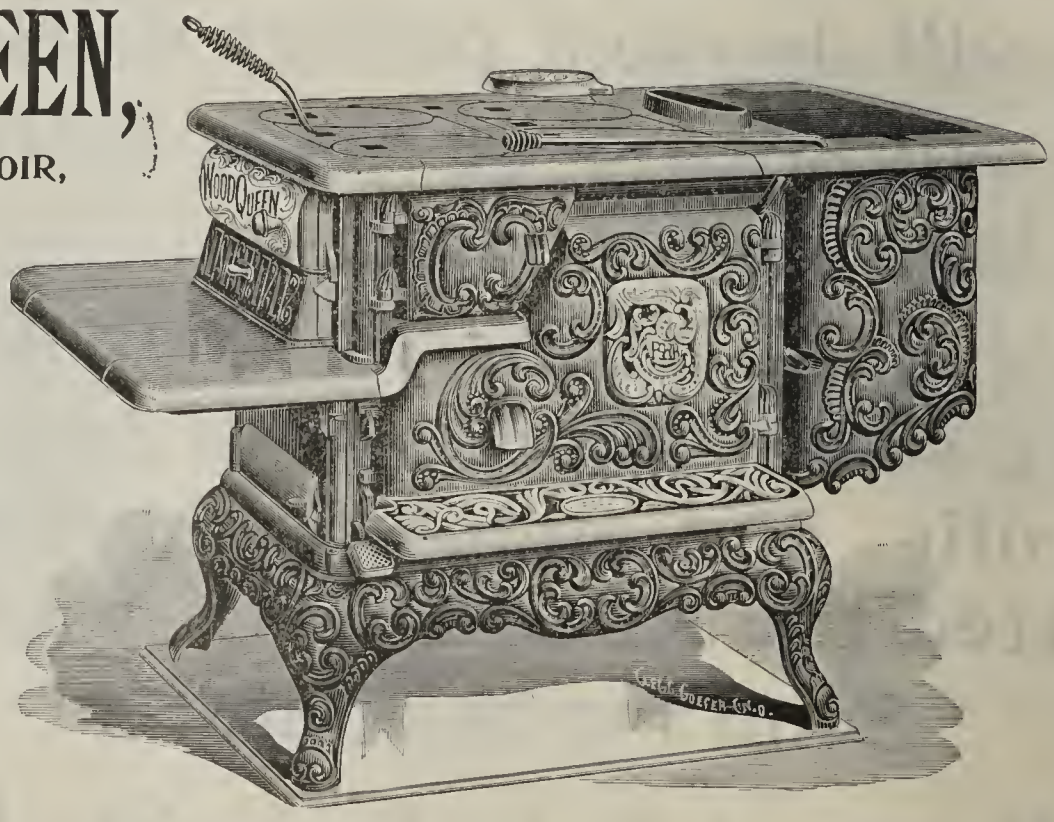
THE MOSTEST GOODS FOR THE LEASTEST MONEY. . .

The Stove is "all right" and we can prove it to you by sending you a sample. It is ***"Lansing"*** the trade of our contemporaries and orders are pouring into the ***"Grand Haven,"*** where we take care of them promptly.

THE WOOD QUEEN,

WITH BRACKET RESERVOIR,

is a great big well made wood stove that is beautiful in design and modern in every respect. We have the first time to place a sample that has not brought in a nice order. Send for prices and secure the agency for your town.



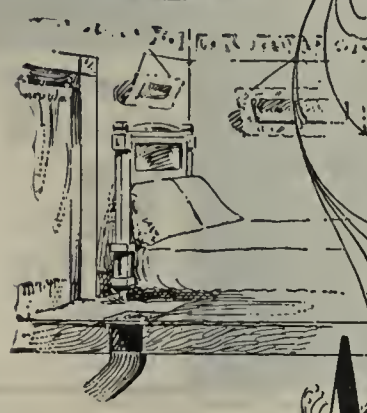
The Portsmouth Stove & Range Co.,

Busiest makers of Stoves and Ranges in the world,

Portsmouth, Ohio.

HART & CROUSE CO.

Royal Heaters.

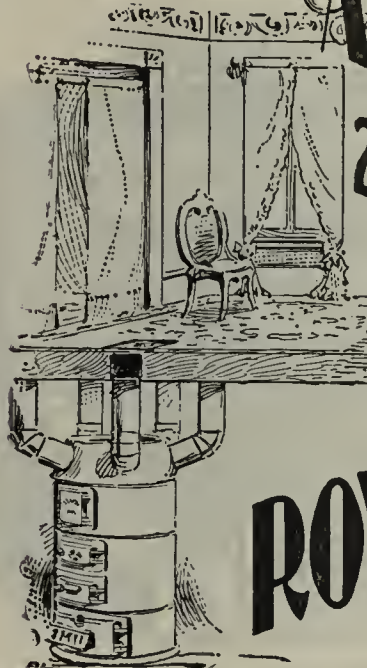


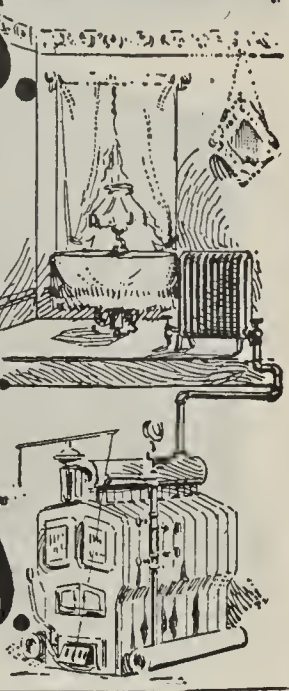


ALL KINDS OF HEATING APPARATUS.

235 WATER ST., NEW YORK.
79 LAKE ST., CHICAGO.

UTICA, N.Y.
COLUMBUS, O.
ST. LOUIS, MO.





ROYAL HEATERS LEAD ALL OTHERS.

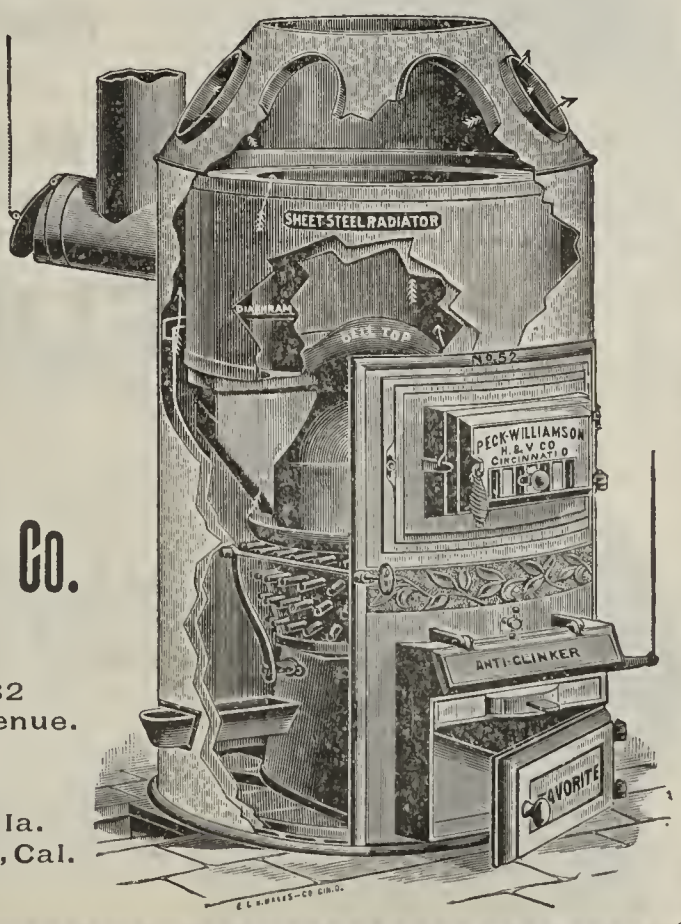
SOLD ON THEIR MERITS, NOT ON THEIR ANTIQUITY.

Surprising Results

are obtained by users of the

FAVORITE FURNACES.

The Favorite Furnaces are so recognized and endorsed everywhere because ***they are.*** Our agents have never had to take one out or substitute another make. They are constructed on honor, and to use them is to attain that satisfaction in a heating apparatus so essential but difficult to obtain. Can't you place one or more in your vicinity? We ship same day order is received. There's money in it for you, Dealer.



The Peck-Williamson Heating & Ventilating Co.

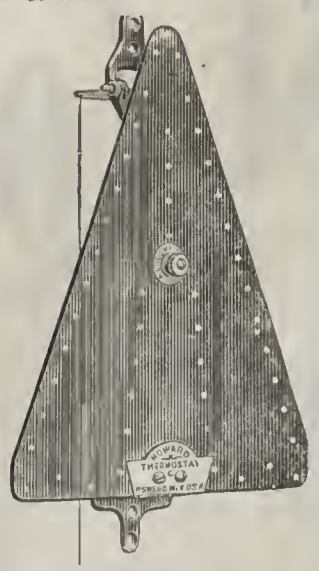
HOME OFFICE AND FACTORY,

335-337-339 West Fifth St., 320-322-324 Perry St., **CINCINNATI, O.** 526 to 532 Freeman Avenue.

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THE THERMOSTAT,
A SENSITIVE PLATE.



TO HEATER DRAFTS OVER PULLEYS.

HOWARD

Automatic
DRAFT REGULATOR
Consists of a
Plate, Damper and Pulleys.

The *DAMPER* is operated uniformly with the changes in temperature and not opened and closed suddenly. The movement and power is obtained directly from the *PLATE*. From a normal position to wide open or closed, the change is but

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PRICE IS POPULAR.
GET POSTED.

HOWARD

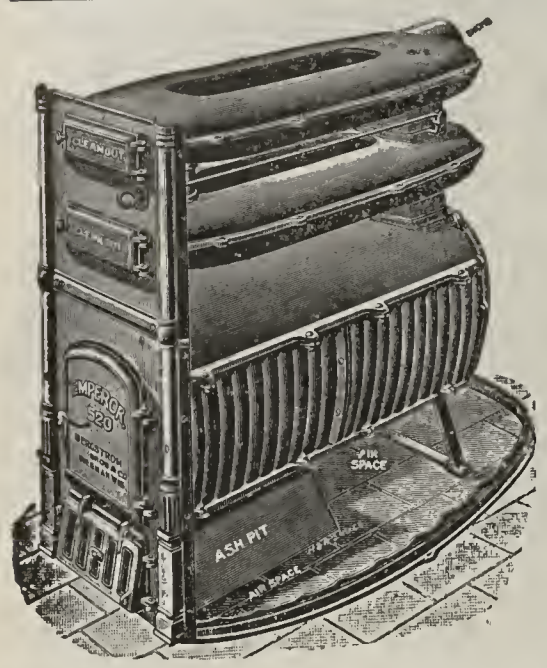
Regulates
Furnaces and Boilers.

YOU should use it. *WHY?* It saves labor and worry about heater; gives nice heat; prevents danger from overheat, and

SAVES COAL.

MADE BY
HOWARD THERMOSTAT CO.,
OSWEGO, N. Y.

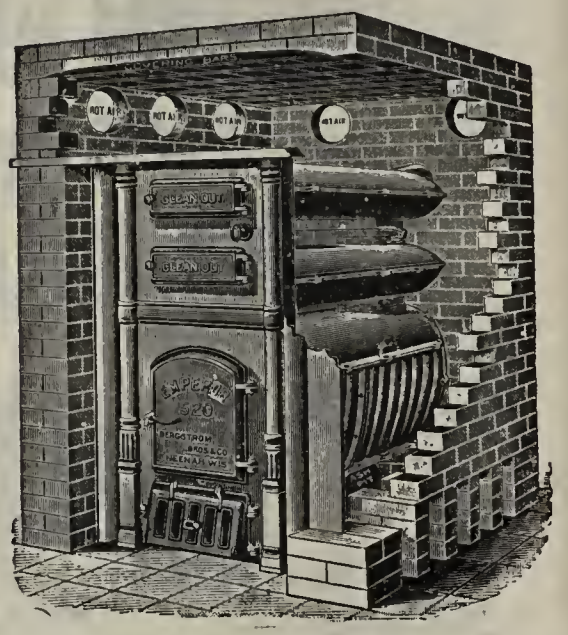
1/4 Off
LABOR,
WORRY,
BAD HEAT,
DANGER,
COAL.

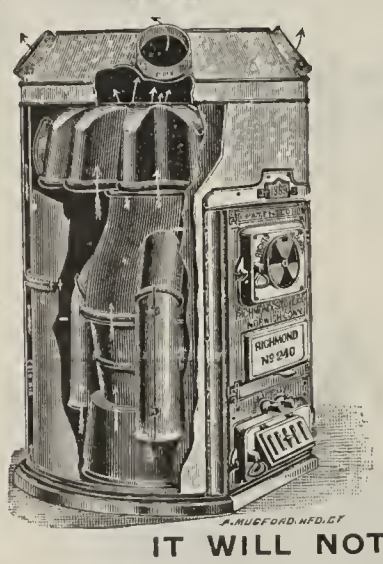


EMPEROR FURNACES

FOR WOOD.

Simple, Safe Durable.
ECONOMICAL IN FUEL.
The Best and Cheapest Line of Wood Furnaces.
Furnished for either Brick or Galvanized iron Casing.
SEND FOR CATALOGUE.
Bergstrom Bros Co.
NEENAH, WIS.





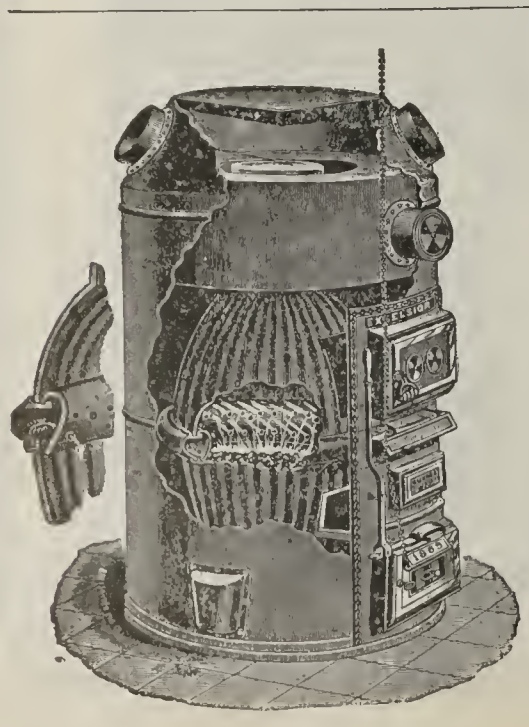
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Hard Coal, Soft Coal, Wood, Gas.

IT WILL NOT COST YOU ANYTHING TO GET OUR CATALOGUE AND PRICES.

THE RICHMOND STOVE COMPANY.

New York, 85 Centre Street. NORWICH, CONN.



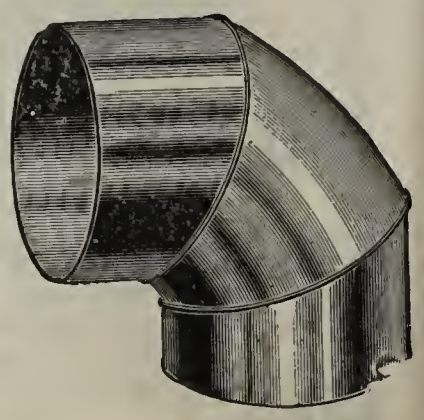
FURNACES
AND
FITTINGS.

ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
AT ATTRACTIVE PRICES.

THE EXCELSIOR STEEL FURNACE CO.,
38 W. MONROE ST., CHICAGO.

See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



of Furnace Pipes and Fittings.

Gurney

HOT WATER HEATERS and STEAM BOILERS have proved themselves to be eminently satisfactory to the Trade and Fitter, in general, wherever used.

It shows a ***Bright Idea*** on the part of the fitter when he recommends the use of Gurney Boilers, as he knows they will stand up to their ratings and do all that we claim they will.

SEND FOR LATEST TRADE CATALOGUE.

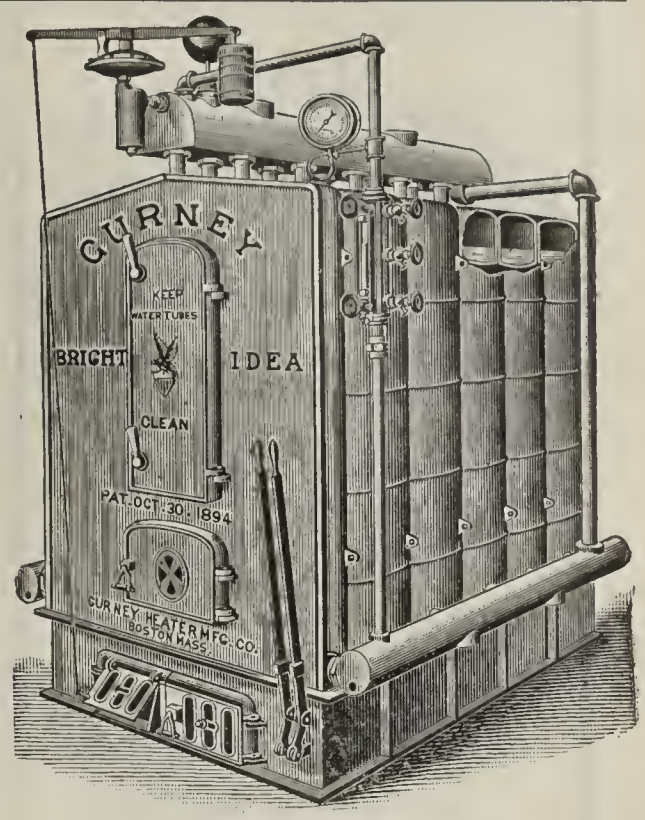
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GURNEY HEATER MFG. CO.,

74 Franklin Street, Cor. Arch,

BOSTON, MASS.

New York Branch:
48 CENTRE STREET.



"BRIGHT IDEA"
Safety Water Tube Steam Boiler.

KEEP YOUR I ON

The Plummer Heaters.

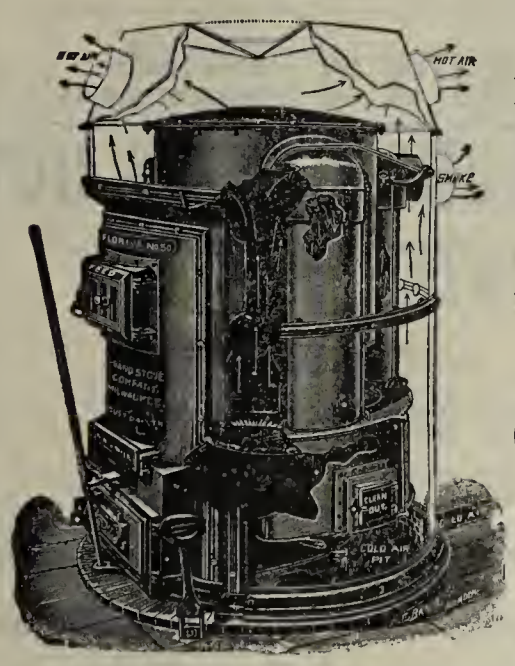
THE PLUMMER BRICK SET **STEAM HEATER,** NEW MODEL.

THE **LEADER** HOT WATER HEATER.

Made in our own plant. Send for Catalogue.

THE PUTNAM FOUNDRY & MACHINE CO., - Putnam, Conn.

THE FAMOUS FLORIDA.
FOR COAL.



Brand's Famous Furnaces.

Revertible Flues.
Extra Large Radiator.
Heavy Fire Pot.
Revolving or Flat Grates.
Very Large Ash Pit Door.
Spacious Ash Pit.
Gas and Dust Proof.
Efficiency in Heating.
Large Radiating Surface.
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Durability Unsurpassed
Made in 3 Sizes.
38-50-60 Inch Fire Boxes.

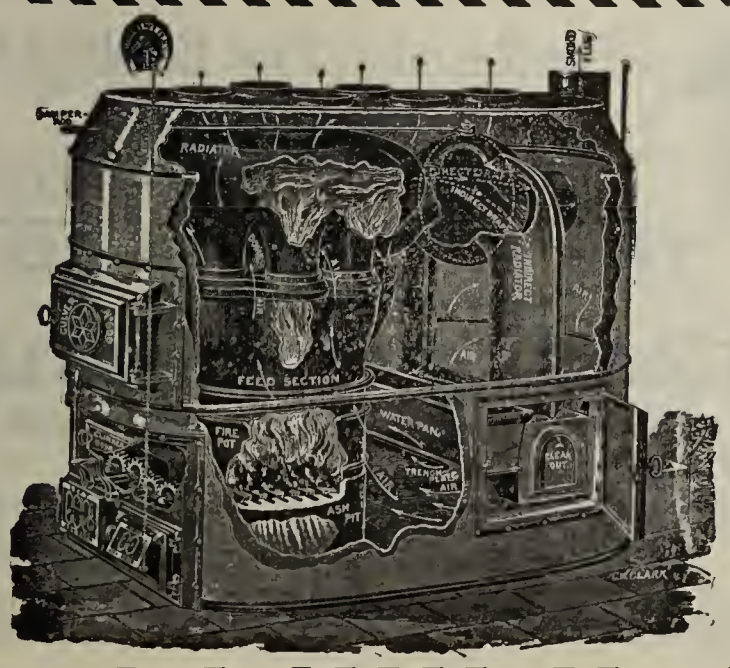
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BRAND STOVE CO.,

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THE FAMOUS MAGNET.
FOR WOOD.





THE SIMONDS FURNACE CO.,

SUCCESSORS TO THE SIMONDS MANUFACTURING CO.,

No. 50 CLIFF ST., NEW YORK,

Manufacturers of the Celebrated

"CULVER AND MONTANA FURNACES."

Double and Single Oven Ranges, with special features and latest designs.

STEAM AND HOT WATER BOILERS.

Our new Elliptic Furnace has unequaled radiating surface and is sure to give satisfaction.

Send for Catalogues and Prices.

STEAM
AND
HOT WATER FITTERS' TEXT BOOK.

Prepared for the Steam and Hot Water Heating Course at the New York Trade School, with Supplementary Chapters on House Heating, Specifications and Surface Estimating.

BY

THOS. E. McNEILL.

140 Pages, numerous Illustrations and Diagrams, 5 x 7 in., Cloth, $1.00.

This manual, comprising nearly 200 questions and answers, and other matter, is intended as a Pocket Companion for the Steam and Hot Water Fitter and the Apprentice. The contents are purely practical and the questions or problems set forth are answered in a simple and direct manner.

It begins with first principles and progresses in so thorough a manner that many of the seeming mysteries of steam and hot water fitting can be readily understood.

The various systems of steam and hot water heating are explained, as well as the various appliances and apparatus used with them, and the manner of connecting them is described.

The book supplies in simple form information that is much needed by the trade on determining the size of pipes for flow and return, the amount of radiation, the size of indirect stacks, how to make an estimate of the materials for a job without error, and how to make out a specification and contract.

Plans of various systems are given and a full account of all the details of a successful heating job.

CONTENTS.

Chap 1. Tools, Fittings and Pipe.
" 2. General Questions on Heating.
" 3. Low Pressure Steam.
" 4. Two-Pipe Steam Heating.
" 5. Single Pipe Low Pressure Steam Heating.
" 6. Indirect Steam Heating.
" 7. Hot Water Heating.
" 8. Single Pipe Main System.
" 9. High Pressure Steam Heating.
" 10. High and Low Pressure Steam Heating and Power Plant.
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" 12. Power Fan or Blower System of Heating and Ventilating.
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" 14. Dwelling House Heating.
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A Good Resolution

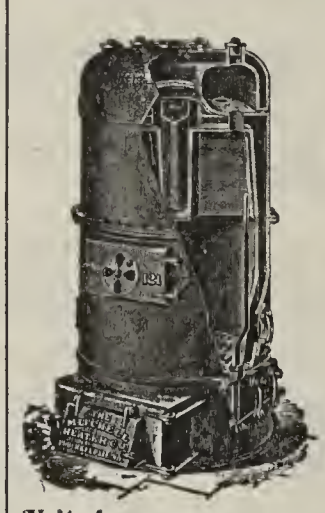
Is to resolve to use Bundy Steam Boilers and Hot Water Heaters, Radiators, Steam Traps, Feed Water Heaters—in fact, their entire line of Bundy heating apparatus and steam specialties.

A. A. GRIFFING IRON CO.,

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BOSTON, 177-179 Fort Hill Square. WORKS, Jersey City, N. J.

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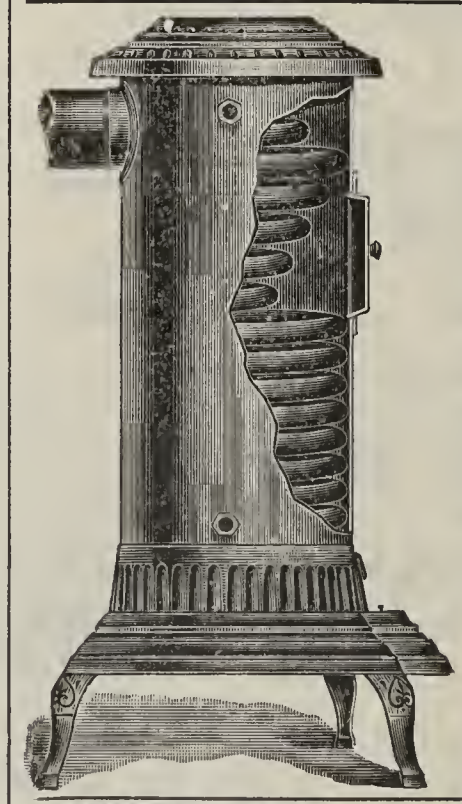
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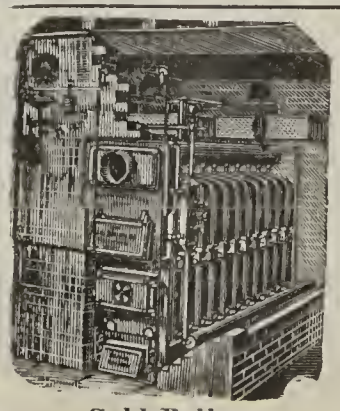
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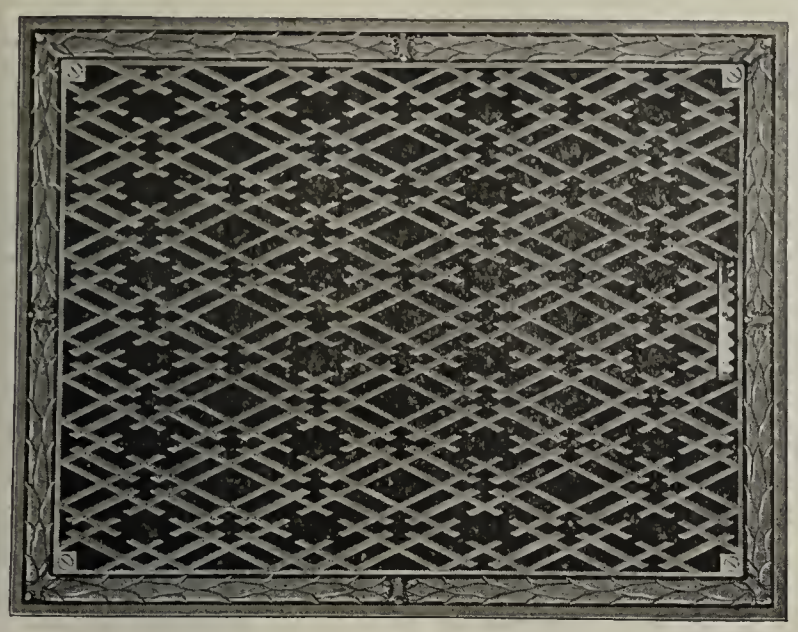
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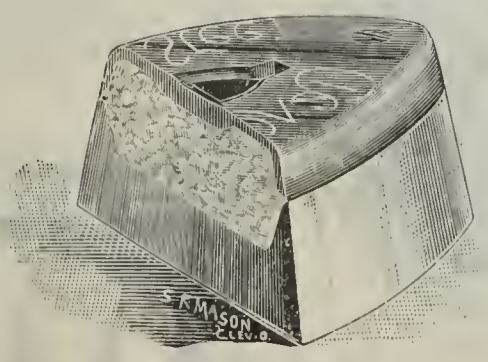
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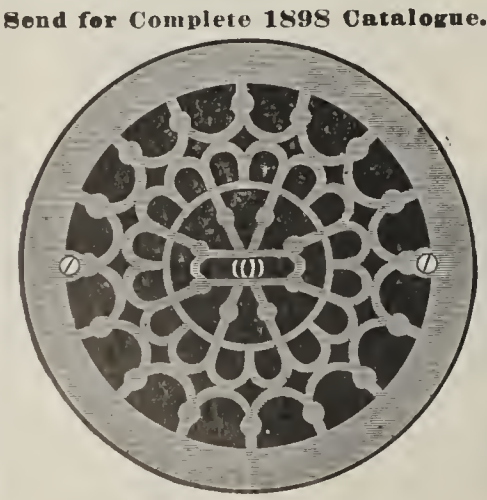
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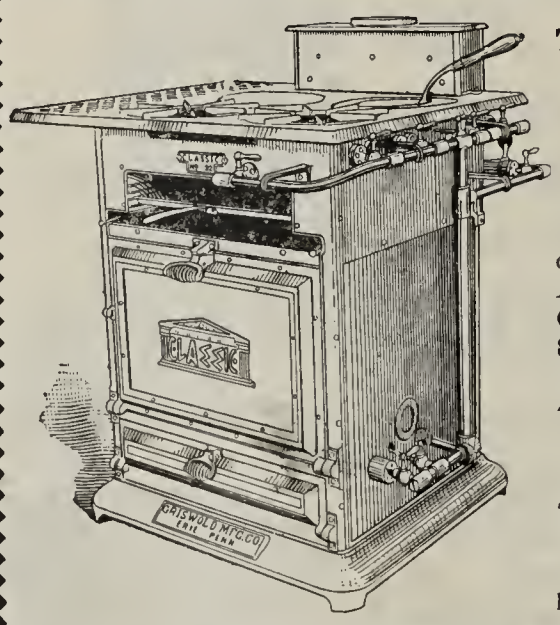
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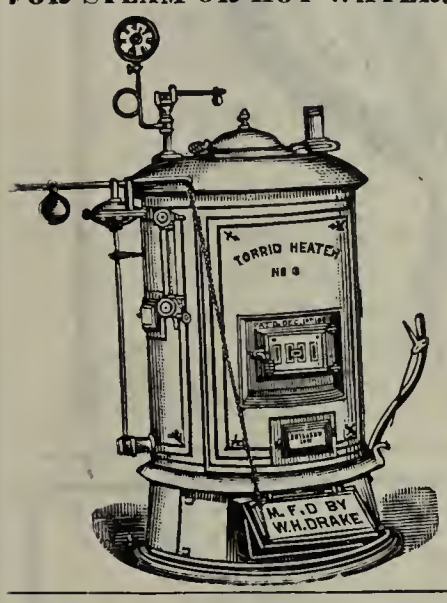
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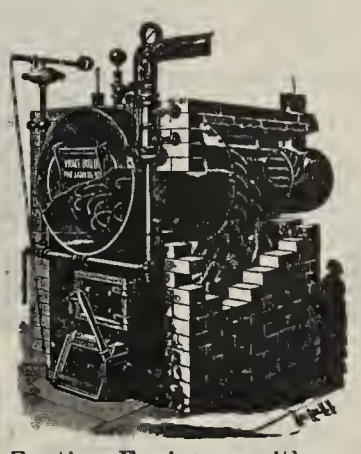
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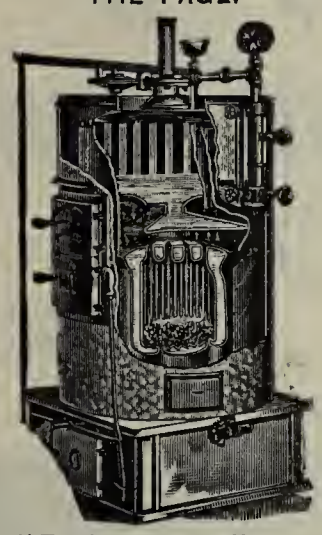
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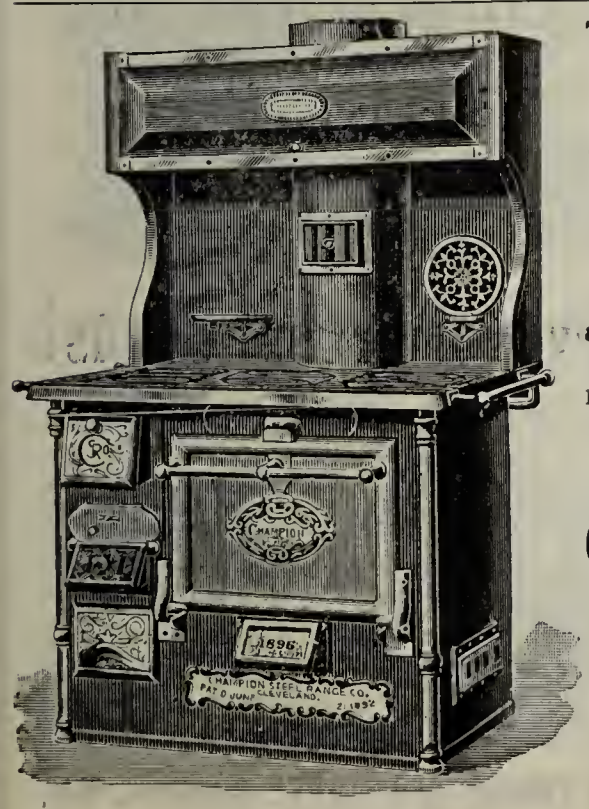
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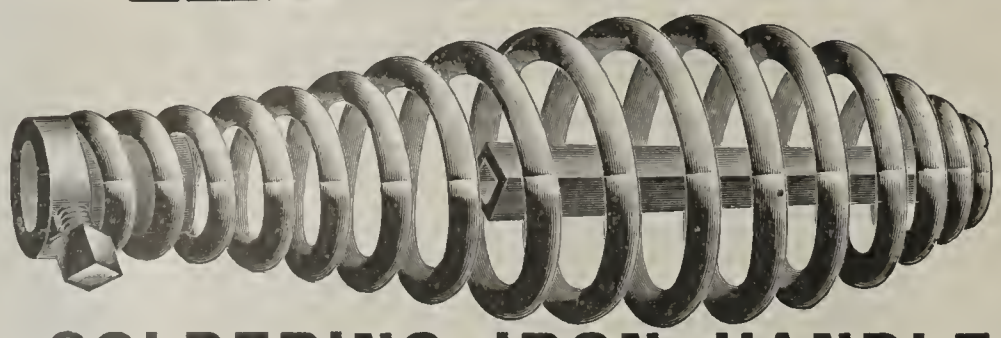
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By the God who makes the thunder,
Let no one put them asunder."

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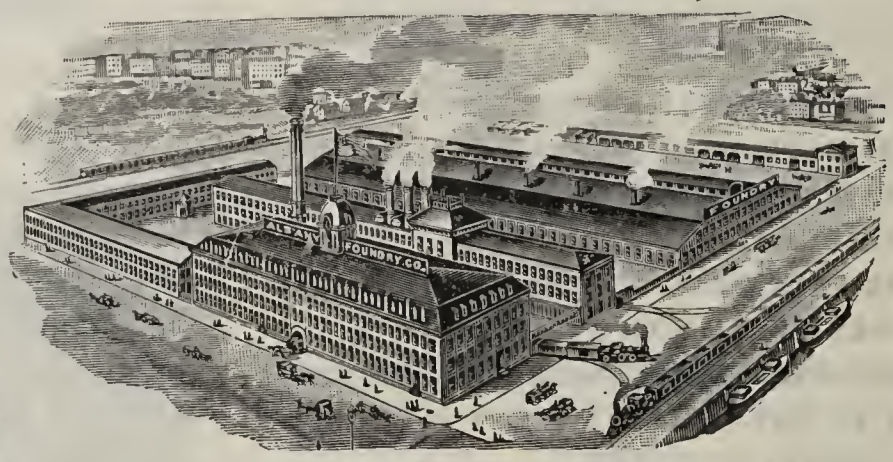
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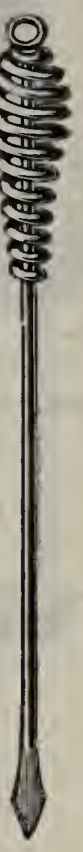
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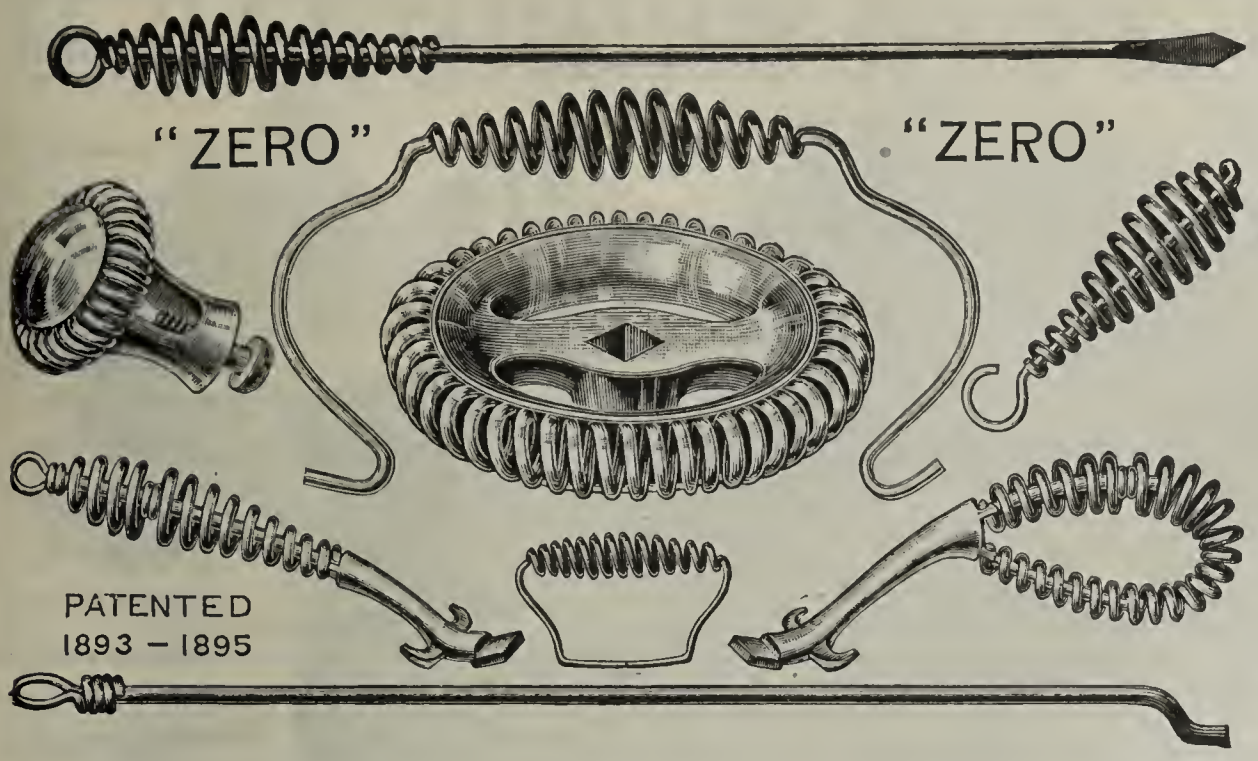
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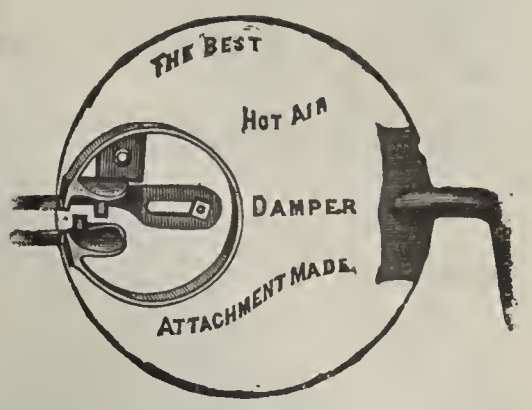
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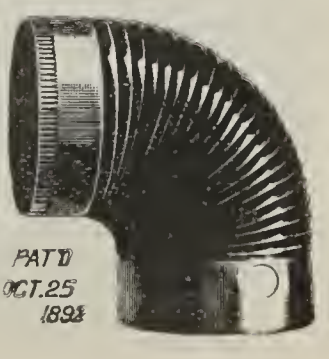
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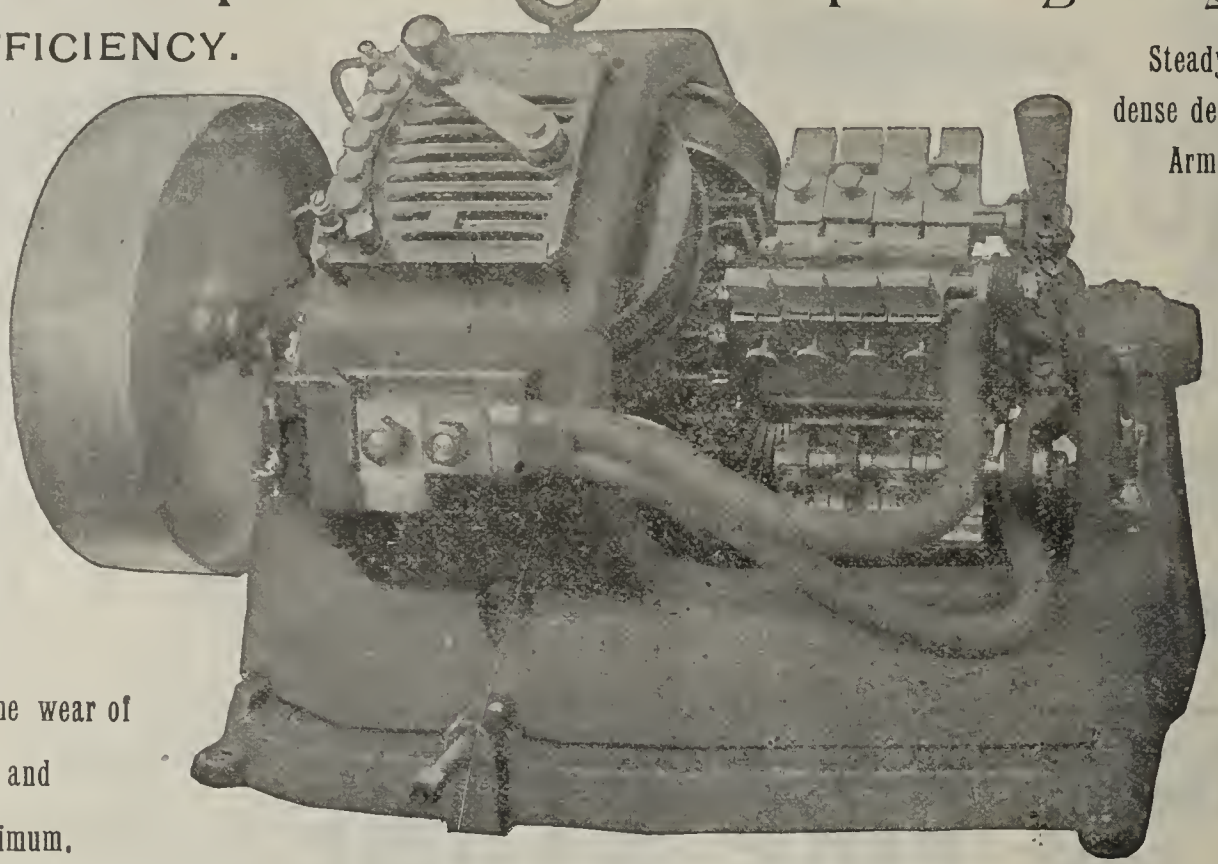


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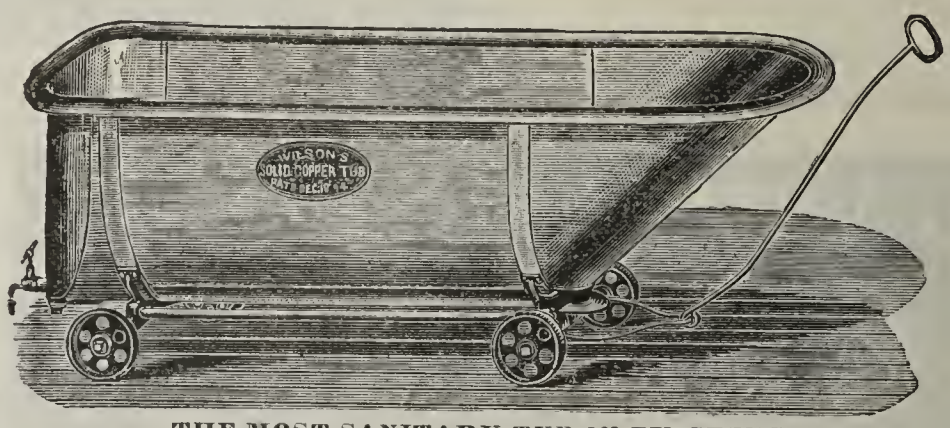
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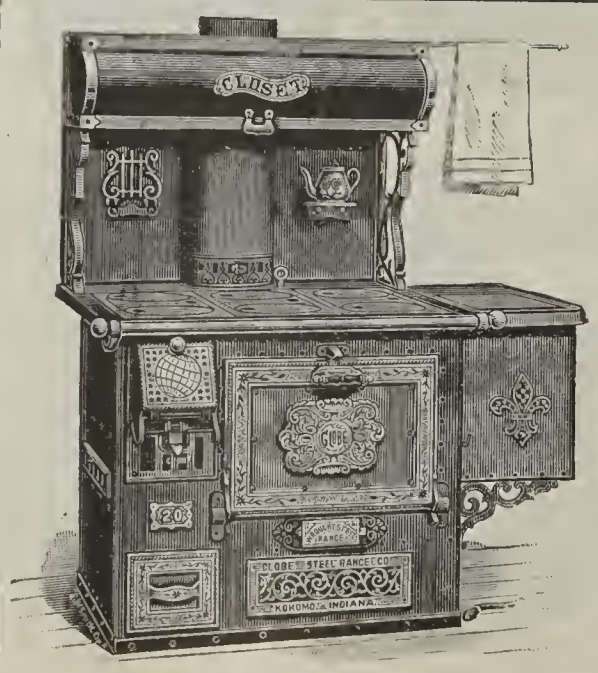
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AS GOOD AS THE BEST,
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SIX SIZES AND ALL STYLES.

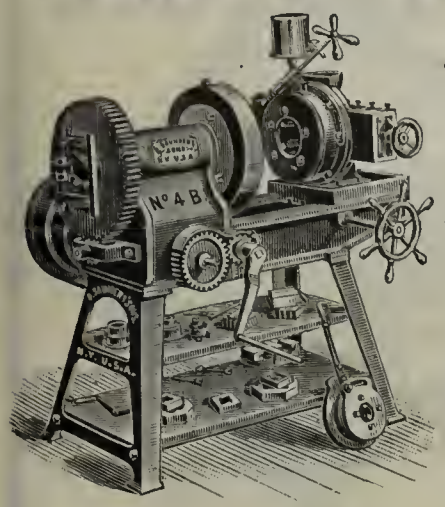
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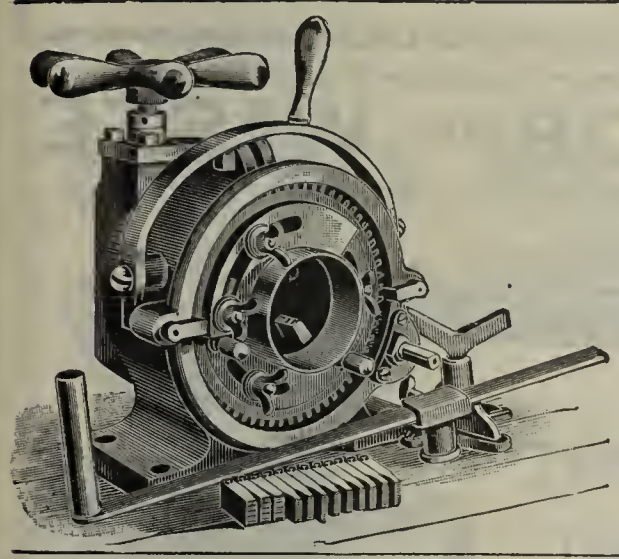
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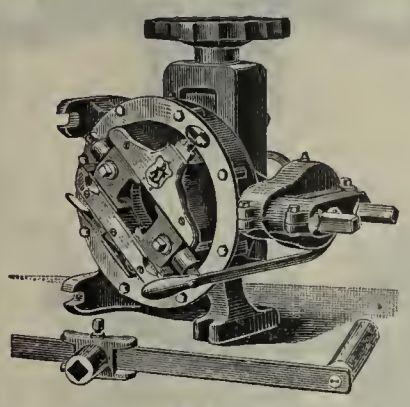
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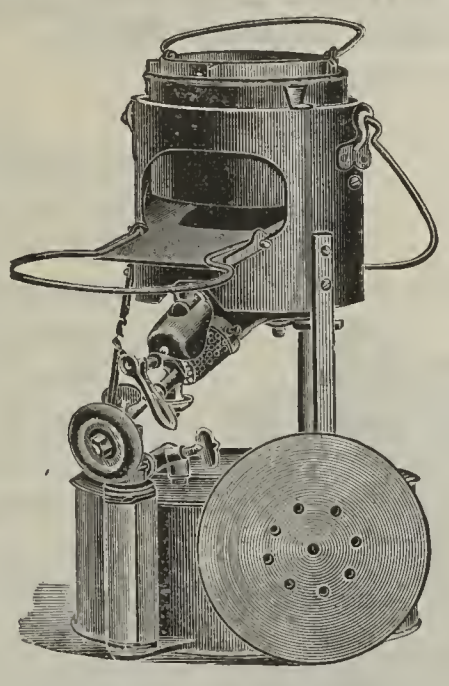


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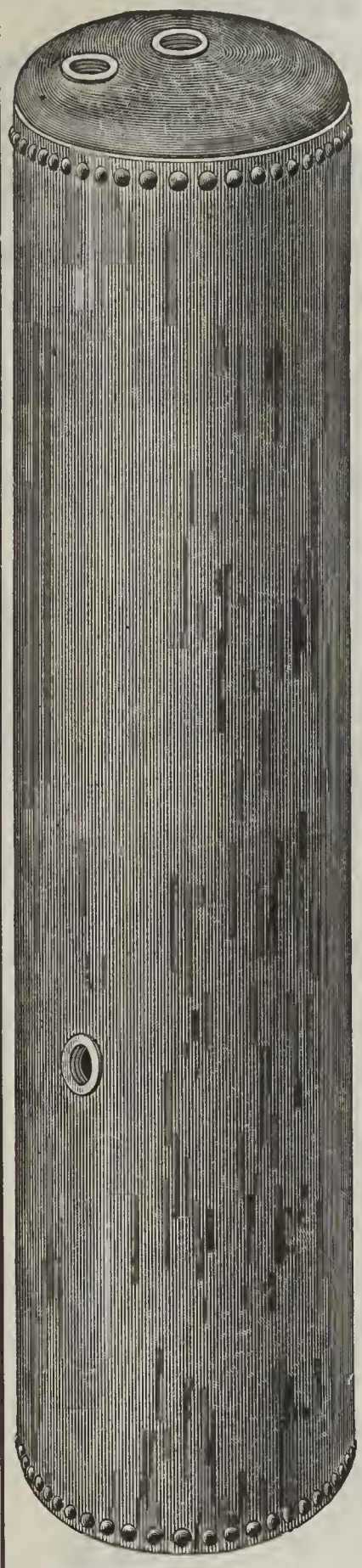
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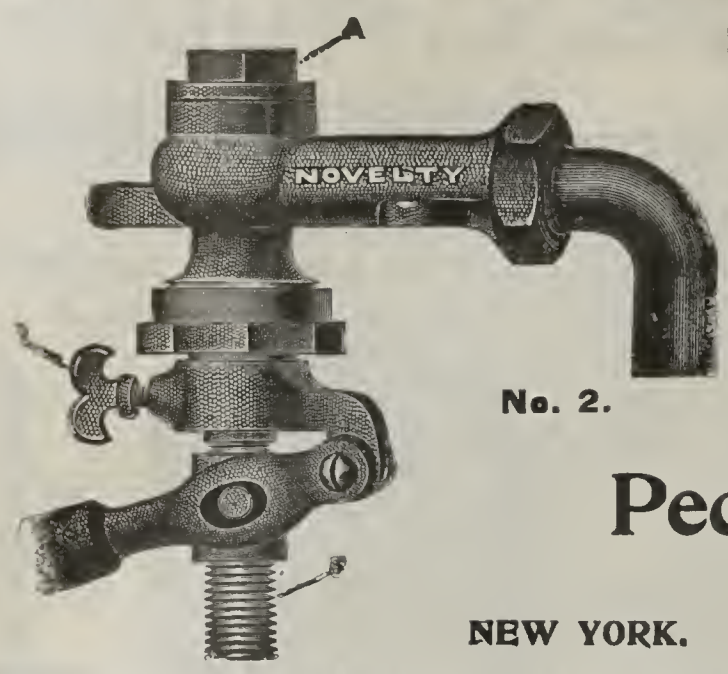
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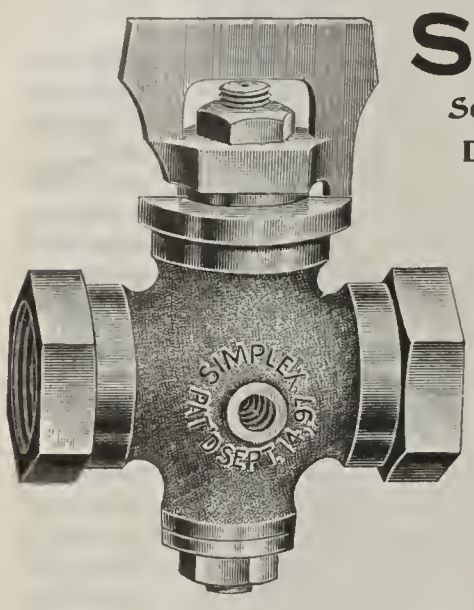
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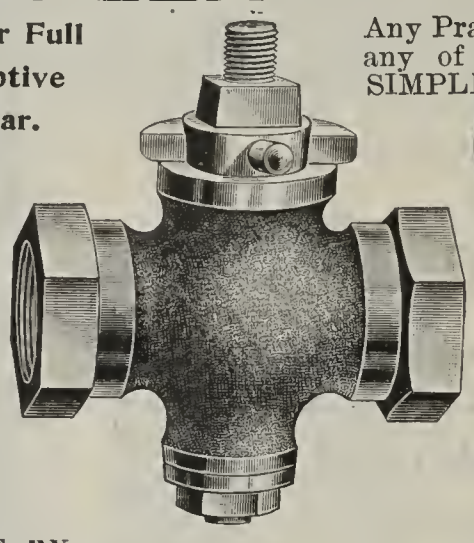
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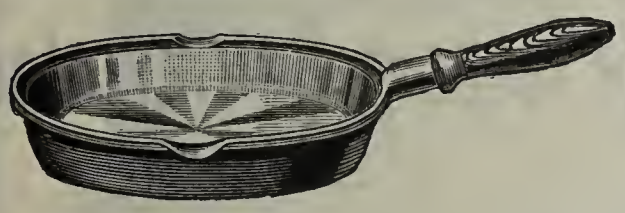
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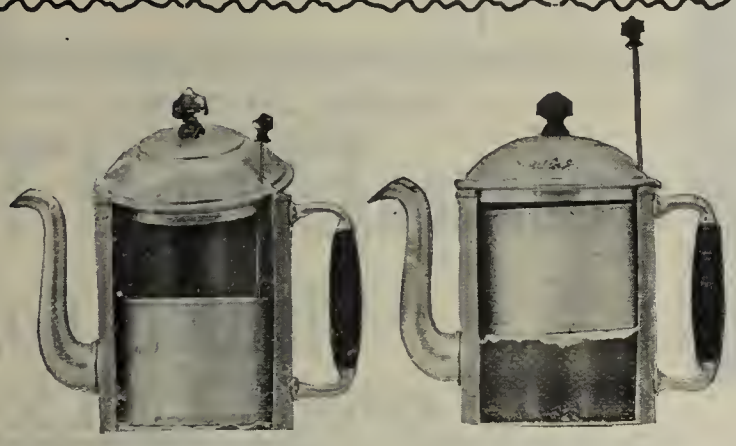
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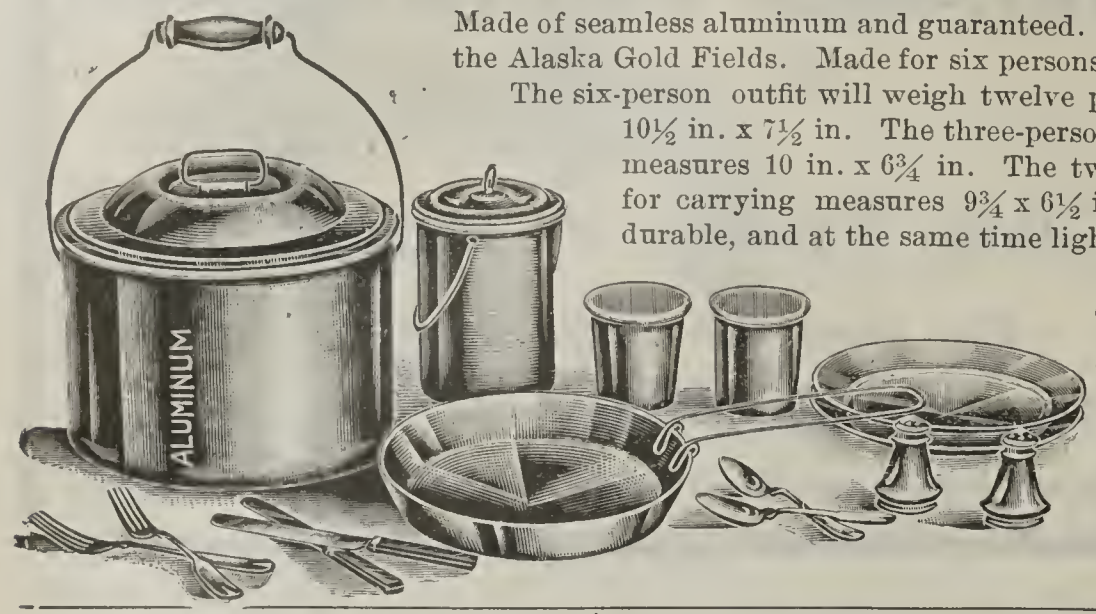
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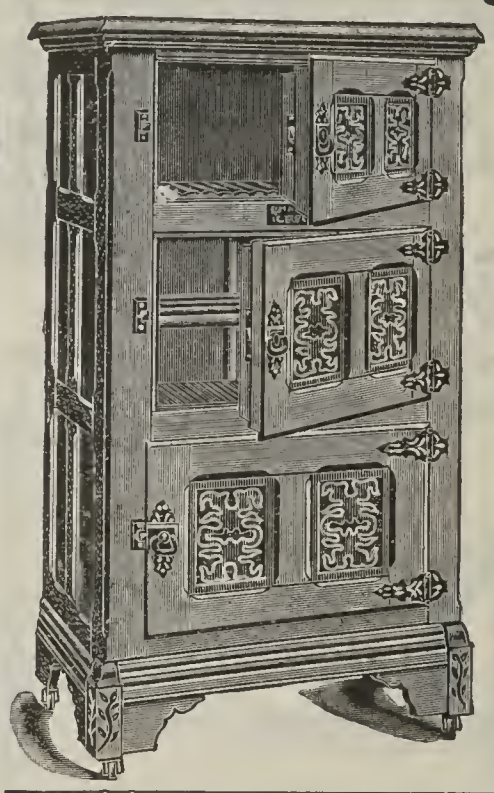
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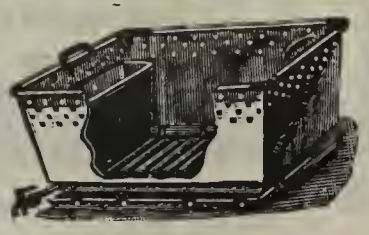
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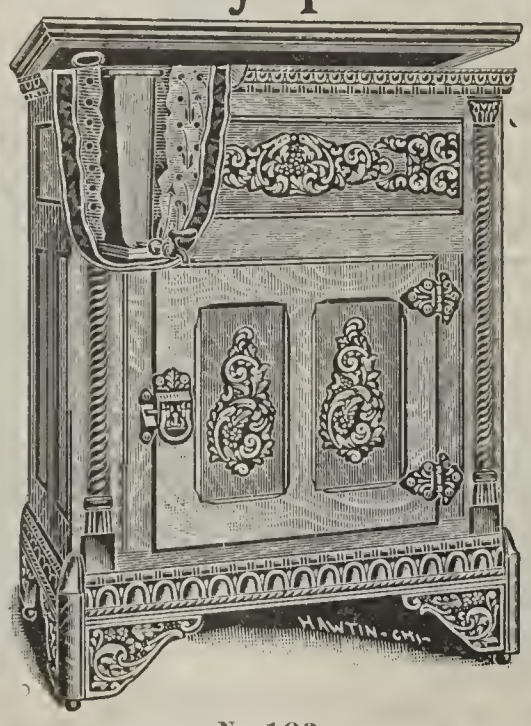
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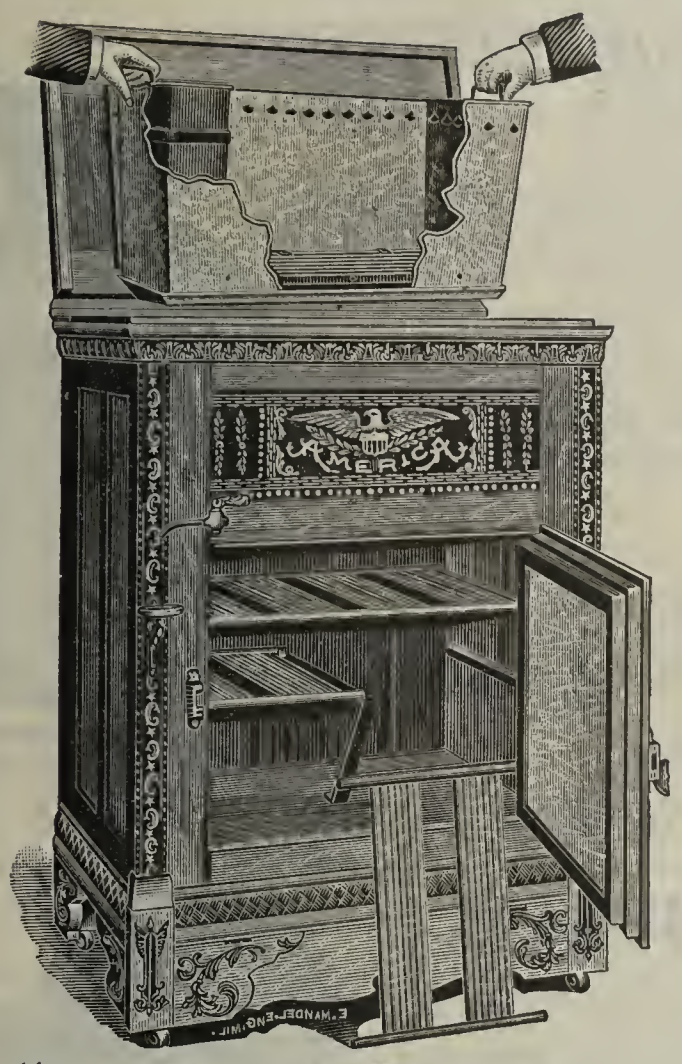
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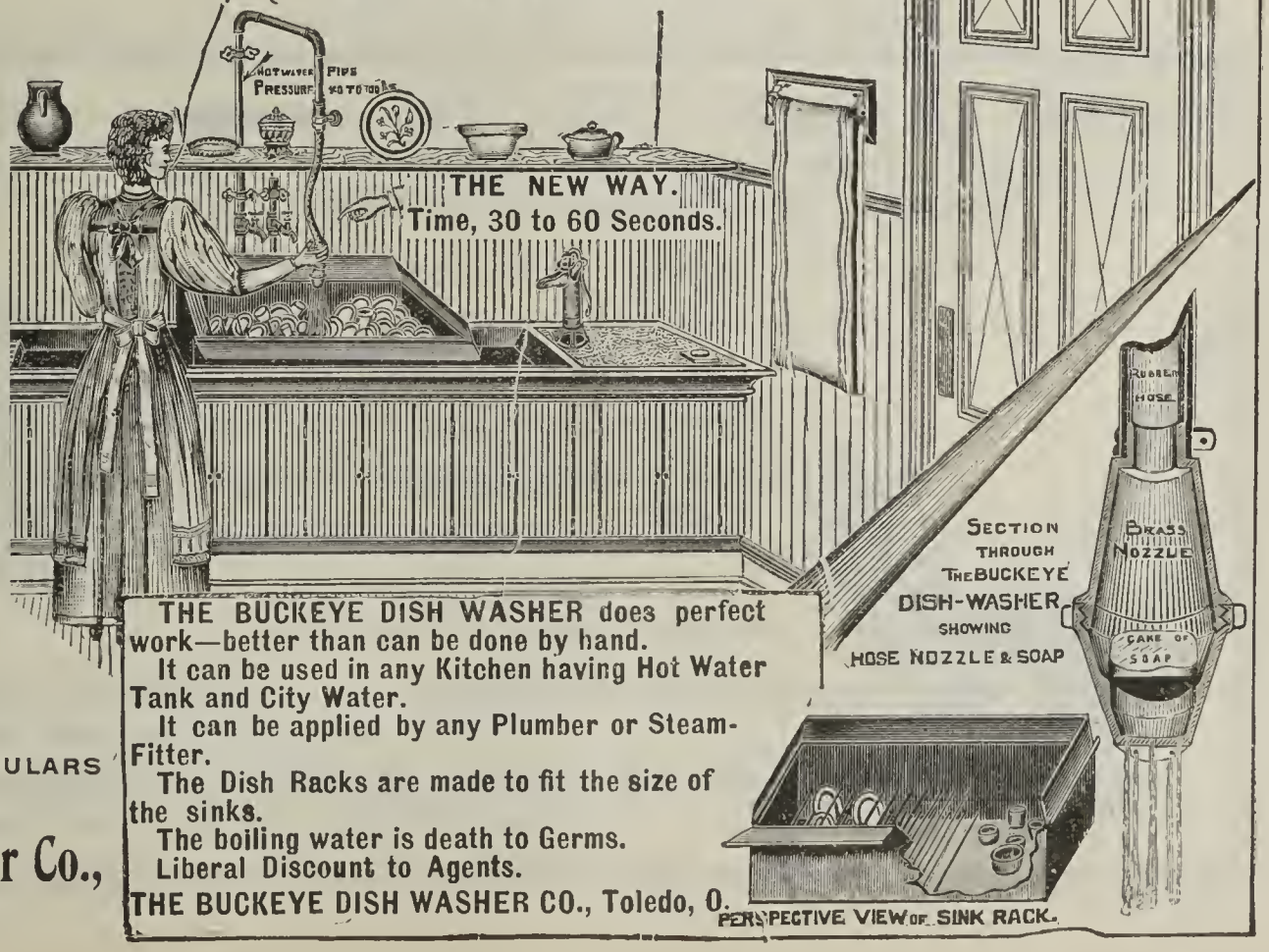
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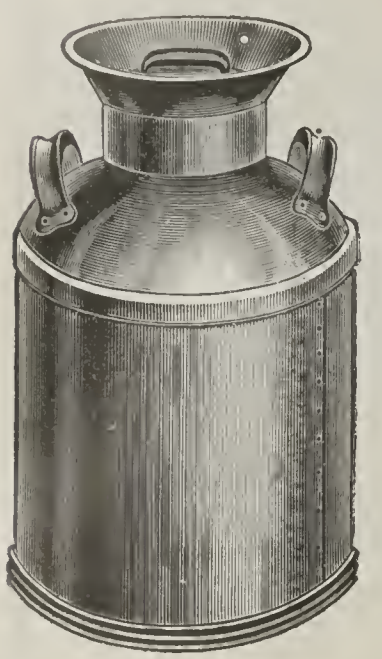
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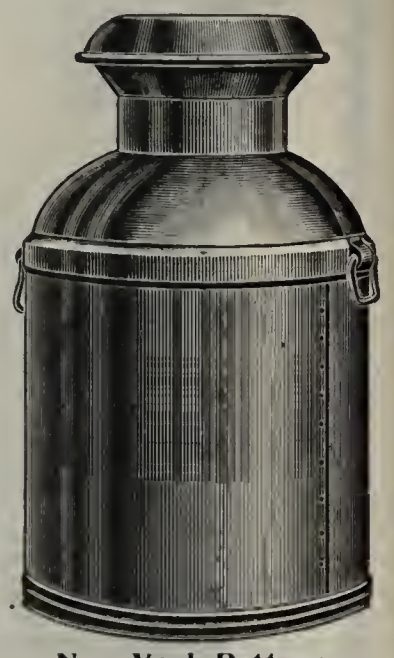
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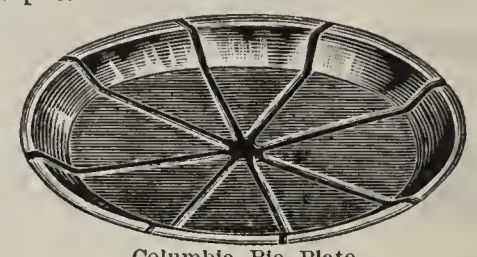
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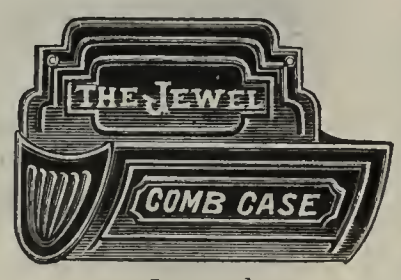


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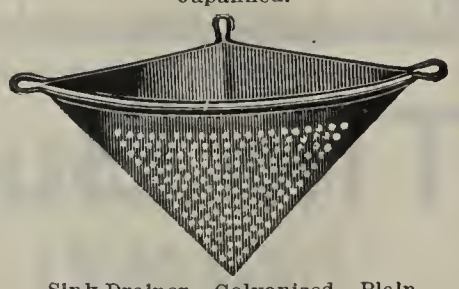
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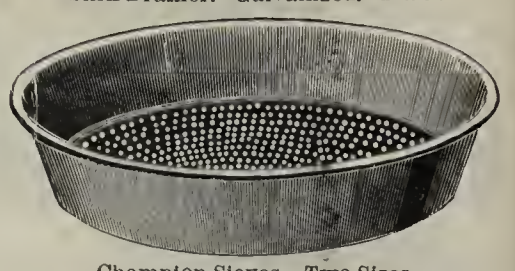
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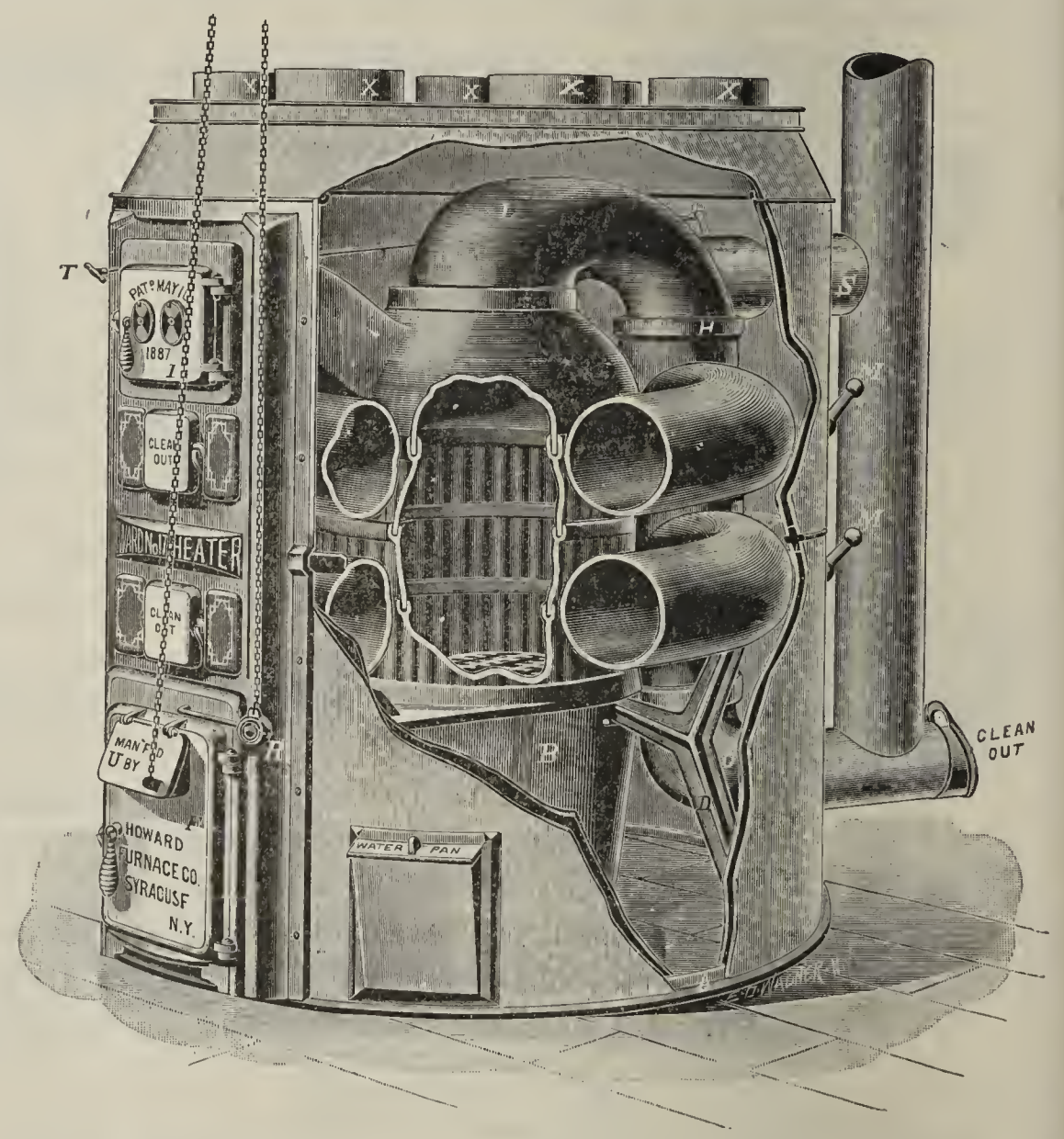
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The Business Situation.

In spite of the persistent and elaborate "war news" served up daily and nightly by certain sensational papers and the unusual activity of the Army and Navy Departments, which in the minds of thinking persons is the best guarantee of peace, the general business of the country goes on growing in volume and activity. The advance of the season and the early setting in of mild, spring-like weather has given increased impetus to the movement of manufactured products all over the country. The demand for goods in nearly all lines shows a steady increase. Spring trade in the West and Northwest is opening up almost a month ahead of time, and from the Southwest come very favorable reports. In the East, too, there is more activity in general business. Although it does not yet measure up to the level of the more favored West, where the increased prosperity of the farmers creates an especially lively demand for merchandise, yet it is getting into better shape. The manufacturing industries generally are busier than for years past, and there is a much larger employment of labor than has been the case since before the depression of 1894. The railways are gaining right along, showing an average increase in net earnings of about 18 per cent. as compared with a year ago. Grain exports continue in unchecked volume, notwithstanding the higher prices for cereals, and are nearly double in volume the exports for last year at this season. Wheat prices have fallen 2¼ cents a bushel during the week, but still hold well above the dollar mark. The iron trade moves along steadily with a demand that keeps step with the enormous production of pig iron. A very large tonnage has been placed for iron and steel during the week, some of which was on Government account. In metals, copper shows great strength. The prices of manufactured copper and brass have been advanced in sympathy with the raw material. The other metals are generally firm, and even tin plates begin to show signs of betterment, although the market remains somewhat dull. The failure to carry out the big consolidation of wire interests has imparted a weaker tone to wire products, but the demand is so large that no radical declines in this department are looked for. Following the sensational declines of last week in the stock market came a sharp reaction during the week under review. The calmer aspect of the Cuban complications, renewed strength of American securities abroad and continued importations of gold, which amount to over $25,000,000 since the movement began, conspired to send up stocks to about the level of two weeks ago. Government and railway bonds also shared in the improvement.

The Waste of Natural Gas.

The Supreme Court of Indiana handed down a decision last week in Indianapolis, which declares that the waste of natural gas is a public nuisance, and can be abated by injunction on the part of the State. The case which called forth the judgment was that of a suit for injunction brought by the State against the Ohio Oil Company, a branch of the Standard Oil Company, who, it was alleged, have been permitting the gas from their wells near Alexandria, Ind., to escape into the air, in contravention of the law. The Madison Circuit Court sustained the demurrer of the company, alleging insufficient facts to constitute a cause of action, but this judgment was reversed on the appeal of the State's attorneys. The law of the State prohibits the escape of natural gas from any well for more than two days after the gas or oil is struck under a penalty of $20 a day fine for each well. This law the State intends to enforce to the fullest extent; and it is reported that if the oil companies do not immediately comply by anchoring their wells and conserving the flow of gas, the work will be done under the direction of the county sheriffs. The decision of the Supreme Court, which was concurred in by all the justices, has caused great rejoicing among the thousands of private consumers and the manufacturing industries of the Indiana gas belt, who have a vital interest in the preservation of the natural gas supply. Since the discovery of natural gas in Indiana the pressure in the wells has fallen from 350 to 150 pounds, indicating the possibility, if not the probability, of exhaustion in the course of time. Consequently, the persistent and reckless waste of the gas by the oil companies caused a strong feeling of indignation throughout the district. The oil men, it is reported, intend to take the case to the United States Supreme Court and will fight it to the last. Meanwhile steps are being taken to collect the accumulated fines, which amount to $5000 or $6000 in some instances.

A Novel Educational Enterprise.

The intelligent enterprise which characterizes the management of the International Correspondence Schools of Scranton, Pa., has taken a novel direction. With the object of calling public attention to the educational work they are doing, they have caused to be built a handsome railway car, which is about to be dispatched on a tour through the manufacturing centers of the country. The car, which is fifty feet long and ten feet broad, is fitted with living accommodations for eight persons, including R. J. Foster, the president of the schools, his assistant, John G. Forsythe, and six instructors. The scheme proposed is to locate the car for a time in the immediate neighborhood of large manufacturing establishments and give to those interested a practical demonstration of the work of the schools. For this purpose the car is

equipped with a large reception room fitted with bookcases, tables and chairs and all requirements for reading and writing. A large store of books and school supplies is to be carried, covering the wide range of technical subjects in which instruction is offered by the schools. The fittings of the car, both outside and inside, are of the most elaborate and attractive description, and inscriptions on the exterior are calculated to draw the attention of the public to its mission in a most effective manner.

Spain Against the United States.

BY R. HUNT.

Affairs between this country and Spain have certainly reached such a critical stage that we feel justified in assuming that we have come to the parting of the ways. This is to be greatly regretted on every account, not only because of the desolation and destruction that will be wrought, nor of the setback to that prosperity we were beginning to feel after years of stagnation, nor yet because war is sinful, but also because of the unsettling of the public credit, the disturbing of our sense of security, the interference with our plans of advancement. The war itself—the time to be devoted to actual fighting—cannot be of long duration, for it may be truly said without arrogating to ourselves any undue superiority that our fleet is a better fleet than Spain's. We have a larger number of ships, of greater tonnage, carrying thicker armor and mounting more guns. Ship for ship we outclass Spain, and when consideration is taken of the fact that we will operate our forces from their own native ports while Spain's ships will have to come 3000 miles to reach the theatre of the war, the odds against her meeting with any success are decidedly great.

Heretofore in telling our readers about the navy of Spain and the navy of the United States we have avoided placing the fleets of these two countries in juxtaposition, the one against the other, for we have all along hoped the occasion for such a comparison would be lost, and that whatever difficulties might exist between the two Governments would be amicably settled.

Spain has a fleet composed of 12 armored ships; ours consists of more than 30 armored ships. Of unarmored ships, cruisers and gunboats, of a displacement greater than 500 tons, the lists give to the Spanish Navy 38, and to ours 50 or more. For purposes of comparison too much reliance must not be placed on these figures, numbering as they do not only the old worthless ships with the newly built effective ones, but also the hulks, and the ships building, that could not possibly be entered into active service for a year or more. The exact condition of our own navy is pretty accurately known. Such, however, is not the case with the Spanish fleet. None the less, in the comparisons we are about to institute, full justice will be done the Spanish ships, the benefit of every doubt being willingly accorded them.

To begin with, let us pass in review the armored ships of the two rival navies, for by considering the number and character of this armored tonnage we ought to arrive at a tolerably fair estimate of fighting strength. Doing her very best Spain can mobilize now, at the outside, not more than eight armored vessels of all classes. We can put into service a good 24, a proportion of three to one in our favor. But this armored force needs differentiating. Two of Spain's ships are old, obsolete, with poor armor and slow speed, but with good modern batteries. Ten of our ships are antiquated monitors, with inferior armor, inferior speed, inferior batteries. On the other hand the 14 vessels remaining in our fleet are more modern, and therefore better armored, armed and equipped, than the six new vessels Spain can bring to bear against us.

Spain has but a single battle ship, the "Pelayo." We have four, the "Indiana," "Oregon," "Massachusetts" and "Iowa." Some interesting particulars of these opposing battle ships are here given:

	"Pelayo."	"Indiana."
Displacement, tons	10,000	11,000
Speed, knots	16	15.5
Armament	Two 12.5", two 11", twelve 4.7", one 6".	Four 13", eight 8", four 6".
Total energy of fire in foot-tons	134,000	213,500
Armor	Complete belt, 18 to 12". Barbettes, 18".	Partial belt, 18". Barbettes, 17".

In estimating the energy of fire the same initial velocity and weight of shot have been assumed for the guns of both ships. This we believe to be perfectly fair to the gun power of the Spaniard. From the data above we gather that the "Pelayo's" one point of superiority is speed. Speed in a battle ship is not a requisite. It never yet won a fight, and to win fights is all that is demanded of the type. The "Indiana's" gun energy is vastly the greater, and her armor is nickel steel to the other's hardened steel.

Another excellent ship in the Spanish Navy is the "Emperador Carlos V," just completed. Our new armored cruiser, the "Brooklyn," is something like her, and to a less extent so is the armored cruiser "New York." The interesting data pertaining to these three ships we place side by side:

	"Brooklyn."	"Carlos V."	"New York."
Displacement	9,250	9,100	8,500
Length	400	380	380
Armor belt	3	2	4
Gun armor	8 to 5	10	10 to 7
Armor deck	6	6	6
Speed	22	20	21
Coal supply	1,650	1,700	750
Complement of men	500	535	485
Armament	Eight 8", twelve 5".	Two 11", eight 5.5", four 4".	Six 8", twelve 4".
Total energy of fire in foot-tons	85,700	71,900	54,600

The cardinal differences observable between these three ships lie in the armor and the armament, and these are irreconcilable. The "Brooklyn's" armor is the latest development of Harveyized nickel steel; that on the others is not so. The 11-inch guns of the "Carlos" ought to enable her to engage a heavier antagonist than the "Brooklyn;" on the other hand the "Brooklyn's" thicker side armor ought to enable her to stand to her work better than the "Carlos." This is equally true of the "New York," though the battery of the "New York" is inferior in energy of fire to either of the others. Looking at the ships from a theoretical point of view, we should say that the "Brooklyn" ought to overcome the "Carlos," and the "Carlos" the "New York."

Another type of Spanish armored cruiser is that represented by the seven 7000-ton ships, four of which, we believe, can be put quickly into commission. We have no corresponding type in our service; indeed it was with the hope of securing some similar ships that we approached the foreign shipbuilders. Our nearest approach in size is to be found in our second-class battle ship "Texas." How she compares with the "Oquendo," one of the Spanish class now at Havana, is as follows:

	"Oquendo."	"Texas."
Displacement	7,000	6,400
Length	340	301
Belt armor	12	12
Gun armor	10.5	10 to 12
Deck armor	3	4
Speed	20	18.5
Coal	1,200	800
Complement	500	400
Armament	Two 11.2", ten 5.5".	Two 12", six 6".
Energy of fire in foot-tons	78,000	77,760

Although the fire energies of these two ships are about equal, yet for all round purposes the battery of the "Oquendo" is preferable. However, we should not lose sight of the fact that the "Texas" is a battle ship, not a cruiser, and would be expected, by reason of the different distribution of her armor, to hold more than her own in an engagement with the "Oquendo."

As stated elsewhere, Spain has four of this "Oquendo" class. To tackle the three others we would have three battle ships, one armored cruiser, six monitors and a ram. This list includes the battle ship "Oregon" and monitors "Monterey" and "Monadnock," now in the Pacific. We might with propriety exclude these from our count, and we might even go so far as to increase the armored force of Spain in our waters by adding to her six excellent ships her two old-fashioned broadside ironclad frigates, bring-

ing the number of her fighting ships up to eight; yet have we here, to-day, in the Atlantic, under Admiral Sicard's command, 12 fine vessels to oppose to them. The two armored fleets then would stand opposed to one another as follows:

	Spain.		United States.	
	No. of type.	Guns in main battery.	No. of type.	Guns in main battery.
Battle ships	1	17	4	56
Armored cruisers	7	86	2	38
Monitors	..	..	4	24
Rams	..	..	1	..
Totals	8	93	11	118

It is difficult to avoid concluding from this evidence that in the sea we are a decidedly stronger power than Spain, and if it be true, as the late Admiral Aube, Minister of the French Navy, said, "That, other things being equal, that nation which has the greatest number of ships afloat at the beginning of hostilities will be the mistress of the seas," then must our navy dominate Spain's.

We must next consider the unarmored ships of the two nations. Spain has 30; we have 50. Rating these according to displacement tonnage we find as follows:

	Spain.	United States.
First-rates, 5,000 tons and over	2	3
Second-rates, 3,000 to 5,000 tons	6	11
Third-rates, 1,000 to 3,000 tons	9	29
Fourth-rates, 500 to 1,000 tons	13	7
Totals	30	50

How many of these 30 unarmored Spanish ships are available for duty cannot be ascertained; but 36 of the American vessels of this class are now in commission on duty. Out of this number the Atlantic fleet alone has 23. It is but fair to presume that this is a larger number than Spain can muster in these waters, for we know she has several cruisers in the Philippines, some in Africa and the South Sea Islands, and there must be a few of them laid up. So we take it that our cruiser strength is greater than Spain's.

In the way of gunboats, small craft of less than 500 tons displacement, Spain has 80, all good, so states a Spanish newspaper; but good or bad, this is an immeasurably superior force to ours, for we have never a one. However, this type of craft is easily improvised. A single gun, supplemented by a couple of machine guns, mounted on one of our big tugboats will make her more than a match for almost any one of these Spanish gunboats. These gunboats may be divided as follows: Displacement, 100 to 300 tons, 40; 50 to 100 tons, 20; 25 to 50 tons, 20.

Quite a large number of these little boats are already in Cuba, but they cause the Navy Department of the United States no apprehension. Within a week a fleet of armed yachts and tugs double this number could be in Cuban waters.

In the way of a torpedo boat force we are distinctly inferior to Spain. She has six destroyers and 20 boats; so we are informed by one authority. This must mean boats of every class, small harbor boats unfit for sea as well as large seagoing ones. A Spanish paper gives the number as 14; this is probably correct. The six destroyers are splendid craft. Four of them are reported as being now on their way to Cuba. These boats have a speed of 28 and 30 knots, and are in every way fit to go with the sea fleet. It was hoped our emissary, Captain Brownson, now in Europe for the purpose of buying ships, would be able to secure some of this class. The other ten boats we can meet, boat for boat.

Finally, in the way of auxiliary cruisers we are decidedly better off. Spain can impress into her naval service 30 first-class steamers of the Spanish Transatlantic Steamship Company, and perhaps 30 more besides. Our Navy Department has a list of over 100 American steamers every whit as good, which they can convert into war ships within a week.

There is no need to longer tell of the two rival navies. Though ours is the larger it does not therefore follow that Spain will not fight it, and fight it long and well. Indeed, there is every reason for thinking she will die hard—if die she must. Aye, there's the rub! for what will it profit us to gain Cuba and subjugate Spain? Will not this fair land of ours suffer too? Will not our brows be bound with scars as well as with victorious wreaths? Is—to put the question in a phrase—is the candle worth the burning? Can no adequate means be yet found, even at this eleventh hour, to save a nation's honor?—*The Iron Age.*

Export Trade in Zinc Dross, Skimmings and Sal Ammoniac Skimmings.

BY EXPORTER.

The demand for export covering these by-products continues, and there appears to be a market abroad for all that are produced in this country, the shipments being made to England (Swansea, Bristol and Liverpool) and to Rotterdam and Antwerp. The dross, which is shipped in the form of slabs, averages 92 to 94 per cent. of metallic zinc, and the zinc skimmings vary from 60 to 75 per cent. metallic zinc, while the sal ammoniac skimmings run from 50 to 55 per cent. of metallic zinc. All these are the by-products of galvanizing works in their different operations of galvanizing, and are derived from the melting of Western and remelted spelter, the sal ammoniac being added as a flux in the galvanizing. The dross is drawn off from the bottom of the pot and the skimmings taken from the top. The slab dross weighs 70 to 75 pounds. A slab and the skimmings are packed in boxes or barrels, ready for shipment. From the running down of old and new scrap zinc, also, which is becoming quite an industry, remelted spelter is produced which is a good marketable article. A by-product covering this line of work also are zinc skimmings, which test 64 to 69 per cent. metallic zinc.

The uses made abroad of these by-products are various. Manufacturers of paint and chemical works consume large quantities, and also spelter makers, who extract the zinc by a process which they keep secret. The majority of the large concerns that produce these by-products have followed the policy of making yearly contracts to the highest bidder at flat prices f.o.b. steamer seaport, or f.o.b. works. The buyers make their bids on the percentage of zinc contained, usually having the lot tested in this country. Sal ammoniac skimmings carry 15 to 25 per cent. chloride of zinc, which can be extracted as well as the zinc, thereby enhancing the commercial value of this grade of skimmings for certain purposes. The present market prices covering the different lines as stated, f.o.b. steamer, are: Zinc dross in slabs, 2.70 cents per pound; zinc skimmings, according to percentage, 1.10 to 1.75 cents per pound; sal ammoniac skimmings, $20 to $24 per ton.

Antwerp Ivory Sale.—Consul Lincoln of Antwerp, under date of February 8, 1898, reports that the first quarter auction of ivory for the present year was held in that city on the 1st inst. The sales covered 126,639 pounds, against 131,638 pounds disposed of during the first quarter sales of 1897. The following were the qualities of ivory disposed of at the auction of the present year: Kongo, 90,409 pounds, of which 2205 pounds were "soft;" Angola, 34,398 pounds; Ambriz, 1543 pounds; Senegal, 293 pounds. The prices, as compared with those realized at the sale of last quarter, showed an advance of 9 cents per pound for heavy tusks and an advance of from 18 to 27 cents per pound for tusks of from 30 to 80 pounds. A decrease occurred in the price of tusks for bangles of 9 cents per pound for the heavy tusks and of 18 cents per pound for light tusks. Flat tusks were in less demand and showed a decrease of 27 cents per pound in certain cases. The prices of tusks for billiard balls were weaker, while the prices for scrivailles of all weights and qualities showed an increase of from 4 to 9 cents per pound. The stock left on hand amounted to 81,585 pounds. The next auction will take place on May 3.

The two new Government torpedo boats, the "Gwyn" and the "Talbot," just completed by the Herreshoffs, were tried for speed on the 3d in Narragansett Bay under favorable conditions, and both exceeded their contract speed, the former making an average of 20.9 knots per hour and the latter 21.1 knots. The company figured that as the "Gwyn" had been in the water about ten days, and the "Talbot" only two, the slight roughness on the former would account for the difference between the two boats, and that they are practically equal.

THE LETTER BOX.

Tinning Cast Iron.

From J. I., Indianapolis, Ind.—Please give me in *The Metal Worker* some information on the process of tinning cast iron.

Answer.—For the benefit of our correspondent we reprint the following from *The Metal Worker* of April 4, 1891. He will find a longer article on the same subject in the issue for November 11 of the same year:

I have often seen inquiries in *The Metal Worker* for information about tinning cast iron, and while I cannot attempt to fully explain the process in a letter, some remarks on the subject may prove of interest and value. A number of difficulties are to be encountered in tinning cast iron, one of which is the difficulty of securing castings that are alike in all respects. The last iron taken from the cupola may not be like the first, as it has been subjected to the action of the heat a longer time. Two lots of castings from the same foundry may also differ, and a similar variation is found in castings from different foundries. The castings to be tinned should be first cleaned from oil or grease, which can be done by boiling in caustic soda water, after which they are to be rinsed in clear water. For the purpose of removing the scale the castings are to be placed in a pickle composed of sulphuric acid and three or four parts of water. After the castings have remained in the pickle for a few days the scale should be so loosened as to be easily removed by washing in clean water or by friction. The scale can also be removed by turning or filing. If it is not convenient to proceed with the tinning after the castings have been cleaned, they should be kept under clean water to protect them from the action of the air. For a flux, take ordinary soldering acid, to which add one-tenth part by weight of sal ammoniac. The cleaned castings are to be dipped in this solution, quickly dried, and then dipped in the melted tin, the surface of which is to be kept from the action of the air by being covered with tallow. While the above is a theoretical method for performing the operation, it may not result successfully, as the iron may not be of such a quality as to take the tin properly. This point can only be determined by actual experiment. Care should be taken during the work to prevent the melted tin from becoming too hot, otherwise the articles will be discolored.

Pay and Work of a Tinner.

From S. R., Sedalia, Mo.—Please inform me through *The Metal Worker* what an up to date tinner is supposed to do—that is, what kind of sheet metal work? I am a tinner myself, but have had an argument with a friend as to the requirements of a modern tinner and would be glad to know what the trade have to say. I would also like to know what wages are paid to sheet metal workers, such as tinners, cornice makers, coppersmiths, &c.

Note.—We leave this inquiry to our readers and should be glad to have replies to it for publication in *The Metal Worker*.

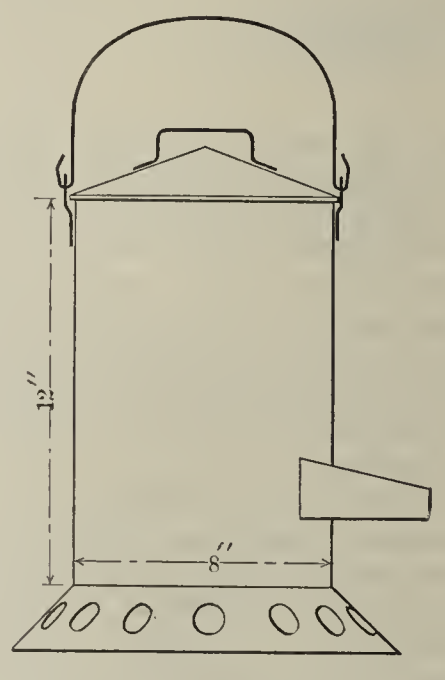
Doing Plumbing Work in Greater New York.

From A. S. R., New York City.—Can a licensed plumber of New York City do plumbing work and put in sewers and water mains in any part of the Greater New York without getting a license in each place before doing the work? If he can I would like to know if it is necessary to register in each place. I would also like to know where I can get a good book that would give questions and answers to the questions that are likely to be asked by the Civil Service and Examining Board of Plumbers.

Answer.—For information as to the scope of a license the inquiry should be addressed to the Department of Buildings, Eighteenth street and Fourth avenue, New York, which has jurisdiction over the plumbing officials. A book by F. W. Tower, entitled "Plumbers' Text Book," can be furnished by our book department, and has been compiled for the purpose of aiding those who desire to pass an examination.

Tinners' Fire Pots.

From Pearl, Newton, Mass.—In answer to the inquiry of "E. E. H.," in *The Metal Worker* of January 22, in reference to fire pots, we contribute the following from



Tinners' Fire Pots.—Fig 1.—Fire Pot for Light Work.

our experience. We make a fire pot for jobbing and small roofs, as shown in Fig. 1. The body is 8 inches in diameter and 12 inches high. The ears to which the bail or handle is attached are riveted on the front and back so that in moving it around or carrying it the weight of the coppers will not tip the fire pot and let the coals slide out into the pan in front. This pan is made in the form of a

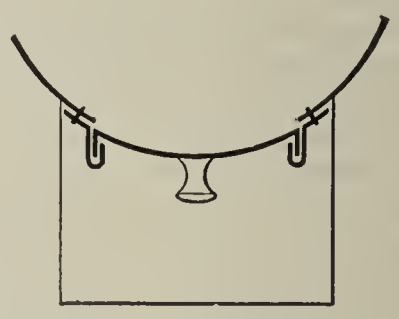


Fig. 2.—Method of Attaching Draft Door.

hearth and is turned up about ¾ inch at the front to keep any coals from blowing out on the roof. We make a slide to cover the mouth when not in use and to regulate the draft, as shown in Fig. 2. We rivet at each side of the opening for the insertion of the coppers a sheet iron guide bent as shown. This runs from the bottom of the opening up above the opening sufficiently high to permit the slide to be kept in place when it is not down and closing the opening. The slide is bent as shown to work in the guides, and has a knob by which it can be raised or lowered.

For big jobs of roofing or for heavy shop work we make a fire pot of the same shape, but 9 inches in diameter and 18 inches high in the body, with a grate and a

back draft. A damper is provided on the pot so that when it is full of coal and the draft adjusted it will heat the coppers as fast as they can be used without stopping to put in coal except about once an hour. The connection for the back draft pipe should be made about ½ inch above the grate line and the pipe should be about 2 inches in diameter. A bottom is put in the fire pot under the grate and a drawer provided at the front for taking out the ashes. A perforated rim is riveted on the lower portion of the body to serve as a stand for the pot and to allow a circulation of air under it. For both fire pots we use a flaring sheet iron cover with a rim, the same as used on a kettle lid, around the bottom, to make it fit tight in the pot. By attaching the back draft pipe as described the fire will burn across from the front of the pot

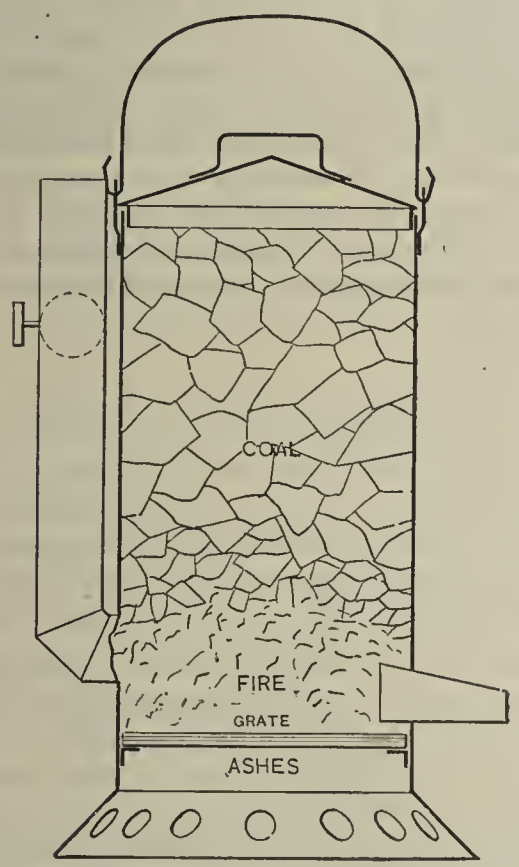


Fig 3.—Fire Pot for Large Work.

to the back without burning the coal above, which will be fed down as required. I make the body of the pots of No. 22 iron and the cover and pipe of No. 24.

Sheet Metal Boats.

From A. T., York, Pa.—Will *The Metal Worker* or some of its readers please give me the necessary information for constructing a rowboat of galvanized sheet iron? What gauge should be used and what would a boat of good proportions, 16 feet long, carry? I have no doubt that some of the readers have had experience in the subject and can contribute a letter that will be of interest to others as well as myself.

Note.—We hope the inquiry of this correspondent will bring out some letters on the construction of boats made from sheet metal. In the meantime we would refer him to illustrated articles on the subject which give considerable information, which appeared in *The Metal Worker* of July 29, 1893, and April 10, 1897.

Lead Lined Tanks.

From H. S., New York.—Answering "C. L.," Grand Rapids, in *The Metal Worker* of February 12: The pitting of sheet lead when used for the lining of tanks is but little known in the Eastern States. The growth of low forms of vegetable life on the surface of the lead has a tendency to develop vegetable acids in contact with the surface of the lead and set up chemical action. In many localities the water is impregnated with carbonic acid gas, which attacks lead in connection with acids developed in the minute fungoid growth, starting pit holes at the points of attachment. The white spots are probably carbonate of lead, which becomes colored by the vegetable matter. Frequent and thorough cleaning of the tanks helps matters some, but painting the interior with red oxide of iron paint and linseed oil, two coats, drying one before the other is put on, will preserve the lead lining a long time. This is a sanitary paint. White lead and oil should never be used; it is a source of lead poisoning.

Attachment for Plumbers' Force Pump.

From J. S., Lockport, N. Y.—Can *The Metal Worker* inform me where I can secure a device that can be placed over a sink strainer and attached to a force pump for the purpose of forcing obstructions out through a sink waste?

Answer.—A pump specially designed for this work is manufactured by J. H. Lawless of Jersey City, N. J. Special pumps made for this work can be secured from any dealer in plumbing goods.

Trouble from Rusty Water.

From J. P. L., Vacaville, Cal.—I wish to state to your correspondent, "Plumber," Pennsylvania, whose letter appeared in *The Metal Worker* of February 19, that if he will discard that cast iron water front and make an ordinary water back from galvanized iron pipe, or black iron pipe he will get over his trouble. I prefer galvanized iron. I have been connecting hot and cold water for the past ten years and never had any trouble with rusty water yet. Years ago, however, I experienced the same trouble with a cast front in Waltham, Mass., but never has it been repeated since I used pipe. I have connected from one to four ranges a day in San Francisco, Oakland, Alameda and other places, and was on the go all the time, but never once had any trouble with rusty water. The cast water front, in my opinion, has too much space or surface inside to rust. Rust settles below the inflow, and as the water flows through keeps it agitated, and as the front heats it throws off the rust, which settles to the bottom, and when some one draws water it throws it in the boiler and the result is rusty water.

Relieving Air Bound Rooms.

From C. T. M., Philadelphia, Pa.—Almost every hot air furnaceman has experienced difficulty some time during his practice in getting a sufficient volume of hot air into a room to warm it to a comfortable temperature. I have noticed in *The Metal Worker* the different ventilating systems that have been shown in connection with hot air furnaces, and am satisfied that they would assist the furnace in its work wherever they are used. I have sometimes provided an exit for the air in the room, so that the warm air can enter, by cutting an opening in the base board of the rooms between two studs and put a small register over the openings in order that the exit of air through the opening may be controlled. The opening should be made into one of the partitions of the building, and in one which runs at least two floors in hight before it connects with the space beneath the roof or the floor of the top story. Some may be skeptical as to the efficiency of this method of exhausting air, but to them I would nevertheless suggest a trial of this method when they have difficulty, and am satisfied from my experience that it will afford them relief. The warm condition of the inside partition is conducive to upward air currents, and the volume of air flowing out of the room into the partition will be found sufficient to greatly increase the velocity of the warm air which enters through the register, and in my experience has been sufficient to secure successful heating where before there was failure.

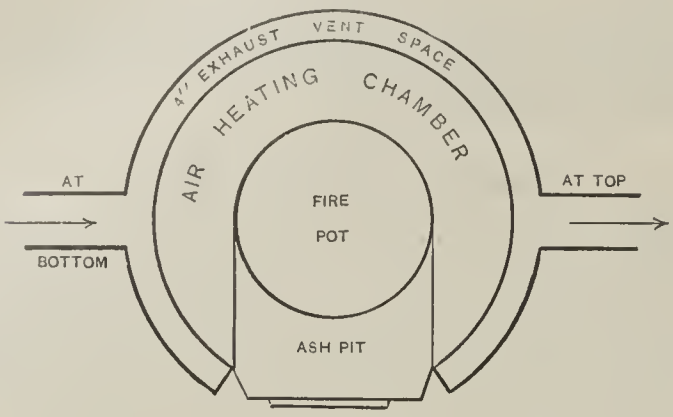
Combined Bath and Laundry Tub.

From K. A., Newark, N. J.—Will *The Metal Worker* please inform me who makes a combined wash tray and bathtub?

Answer.—Goods of this character are made by the Union Granite Company of Weehawken, N. J., and the Robinson Stone Ware Company of Brooklyn, N. Y.

Ventilation in Connection with Furnaces.

From W. L. S., St. Louis, Mo.—It seems to me that the plan I describe herewith might work with jacketed furnaces to cause ventilation and purify the air of rooms heated. My observation of jacketed furnaces is that the casing becomes hot—too hot, when the furnace is run with draft on, to hold the hands against it. This heat is radiated into the cellar, and while not absolutely lost does not answer a very useful purpose, and its loss is unsatisfactory at best. I would propose to put a galvanized iron jacket



Ventilation in Connection with Furnaces.—Fig. 1.—Plan, Showing Proposed Attachment.

around the outside of the casing of the furnace, as shown in Fig. 1, beginning at the iron front at the level of the grate and running around the jacket about 4 inches from it to the other edge of the iron front, extending up to the top of the jacket, then closed in to the casing and closed at the bottom edge, thus forming a closed pocket all around the jacket except at the iron front. From the coldest parts of the rooms heated I would run tin flues, say 4 inches in diameter, to feed into the bottom of this

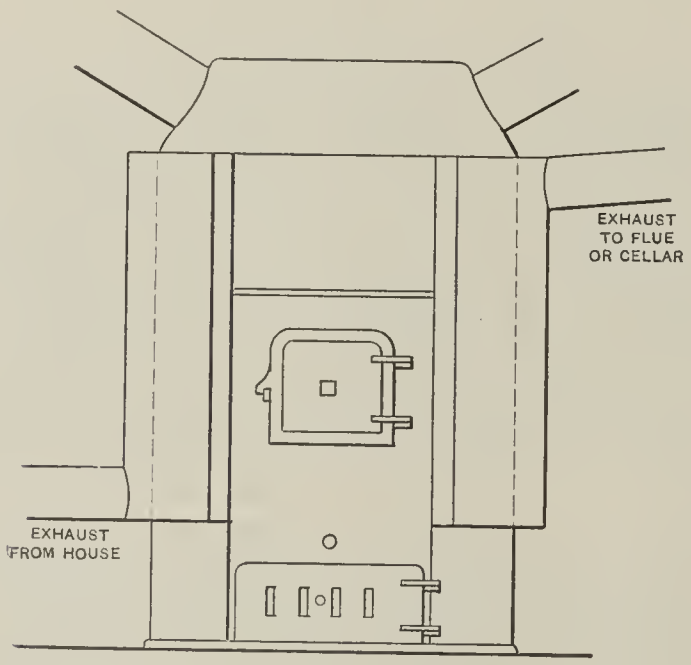


Fig. 2.—Elevation, Showing Inlet and Outlet.

pocket, as shown in Fig. 2, and from the upper edge of the pocket I would run an exhaust flue 8 x 9 inches in diameter to the chimney flue. Circulation would then be established from the room and the air would be warmed and pass out by the exhaust flue. Even if no chimney connection was made with the exhaust flue, and only a 9-inch hole was made near the top of the pocket to allow the escape of the heated air into the cellar, there would be a gain in the heating capacity of the furnace and an improvement in the quality of the air in the living rooms. The air passing out at the top of the pocket would cool and drop down and be gradually carried up through the grate bars, fire and smoke pipe, and away. The adoption of such a plan by furnacemen would save them the necessity of making misrepresentations to buyers that the jackets of the furnaces do not get hot.

Repairing Iron Pumps.

From S. J. S., Maurertown, Va.—I will be glad to have the readers of *The Metal Worker* discuss the methods they have employed for extending the usefulness of iron pumps by repairing them and the valves.

Note.—We trust that the request of this correspondent, being made at the time of the year when not much is going on, will bring out descriptions of the various contrivances that have been devised for repairing not only iron pumps, but other pumps as well. It is not infrequent that the cylinder where the piston valve works becomes worn so large that it seems almost impossible to fix the valve so as to secure satisfactory work from the pump. In some cases a new cylinder of smaller capacity has been placed inside of the pump, and in other cases a cylinder has been attached below the pump and the piston rod lengthened to meet the requirements. When the valves have become so worn that a good seat cannot be made with ordinary tools new valves have been put in where it has been possible. These suggestions may be of some use to our correspondent, but we are inclined to the opinion that he would be more deeply interested in the description of the repairs applied to special cases and hope that the readers will contribute freely.

Capacity of Flaring Tank.

From A. S. R., New York.—Please let me know through *The Metal Worker* how many gallons a tank will hold 4 feet at the top, 5 feet at the bottom and 5 feet high? You gave the rule some time go, but I could not use it very well and would like to have a simpler way.

Answer.—We are afraid there is only one rule for finding the capacity of a tank of the shape our correspondent furnishes, and, while it is a little complicated, we believe by carefully following it out step by step the correspondent will have no difficulty in applying it. The rule given is for a round tank of the dimensions given by our correspondent. Add together the square of the top diameter, or 16, the square of the bottom diameter, or 25, the product of the two diameters, or 20, making altogether 61; multiply that by one-third of the hight, which is five-thirds, and that by 0.7854. The result will be the answer, which is 79.85 cubic feet. As there are 7.48 gallons to a cubic foot, the total capacity of the tank in gallons will be 597¼.

New Publications.

MECHANICAL HEATING AND VENTILATION. By M. C. Huyett. Size, 6 x 8½; profusely illustrated; 155 pages; bound in leatherette. Published by Henry O. Shepard & Co. Price, $3.50.

The above is the title of a book which has just been received treating on the heating and ventilation of buildings by the use of fans. The book avoids the use of algebraic formulas, and presents the matter in a simple manner, providing tables to be used in connection with the rules for determining the proper proportions for various portions of a heating and ventilating system, so that they may be readily understood. It also treats of the various motive devices for operating fans and of the different types of coil heaters for use in connection with them. Illustrations show by means of half-tone sectional views the methods of arranging mixing dampers and devices for automatic regulation. Several types of fans or blowers are shown and tables are presented giving the proportions and sizes of the pipes used in blower systems to accomplish given results and also the weights of the pipes. The book also shows by means of half-tone views buildings in which heating systems have been tested, and the data are arranged for the information of those who are interested in the subject.

The fire loss of the United States and Canada during the month of February as compiled by the New York *Journal of Commerce* reached a larger total than for a number of recent months, amounting to $12,629,300, as against $8,676,000 in February, 1897, and $9,472,000 in January of this year. The principal loss during the month was at Pittsburgh, where a cold storage plant and other buildings contributed nearly $2,000,000.

HEATING AND PLUMBING.

SOME FACTS IN THE HISTORY OF THE BLOWER SYSTEM.—I.

BY WALTER B. SNOW.

The present prominence of the blower system of heating and ventilation certainly lends an interest to the steps by which it has gradually been brought to its present state of perfection. In its general acceptation the term "blower system" is understood to indicate that method of heating and ventilation by which air, tempered to the

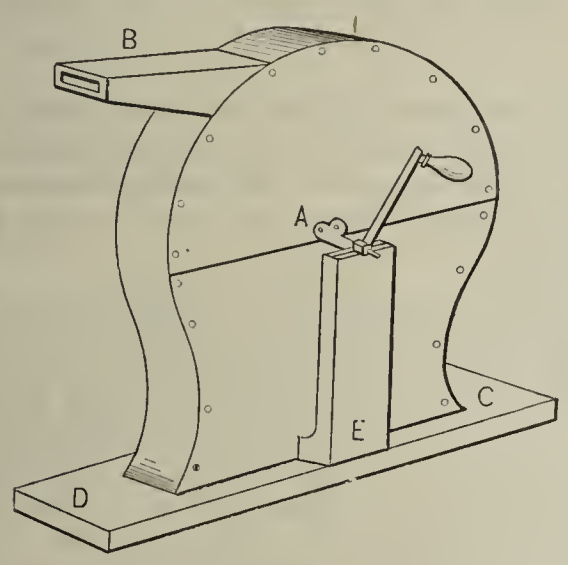


Fig. 1.

proper degree, is forced by a fan blower to the various apartments of the building to which the system is applied. Although the past 15 years have witnessed the real and effective development of this system, yet its origin dates back nearly two centuries.

Just when a fan blower was first actually employed for the purpose of ventilation will probably never be known, but, apparently, the first record of its employment is that to be found in an ancient work by Agricola, first published in 1546. Various cuts indicate the construction of the fan and its application for the ventilation of mines, but, obviously because of the character of this application, there was no means of warming the air.

Although the necessity of ventilation was recognized by many of the early scientists, there seems to have been

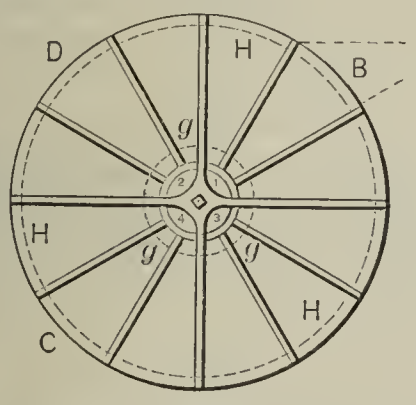


Fig. 2.

no definite move in the introduction of mechanical means for the purpose until the early part of the eighteenth century. An attempt was made in 1660 by the architect, Sir Christopher Wren, to secure satisfactory ventilation in the Houses of Parliament, at London. His plan consisted of nothing more than openings in the ceiling, with, apparently, no provision for admitting fresh air. That this arrangement did not prove satisfactory is evidenced by the fact that in 1723 Dr. J. T. Desaguliers, a noted scientist of that time, was authorized to improve upon it. He first attempted to utilize Sir Christopher's arrangements, but about 1727 began to experiment with fans for this purpose, and in 1735 presented before the Royal Society of London three papers relating to the subject. The first of these was entitled "An Account of a Machine for Changing the Air of the Room of Sick People in a little Time, by either drawing out the foul Air, or forcing in fresh Air; or doing both successively, without opening Doors or Windows."

Accompanying this paper were illustrations, here reproduced in Figs. 1, 2 and 3, of which Fig. 1 is described as representing "a case, D E C B, containing a wheel of 7 feet diameter and 1 foot thick; being a cylindrical box, divided into 12 cavities by partitions directed from the circumference toward the center, but wanting 9 inches of reaching this, being open toward the center and also toward the circumference of the case, in which the wheel turns by means of a handle fixed to its axis A,

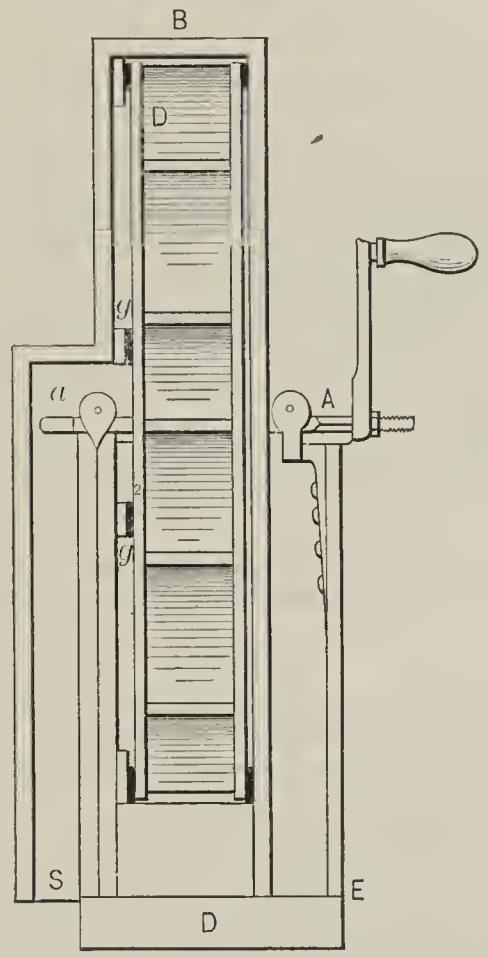


Fig. 3.

turning in two iron forks, or half concave cylinders of bell metal, such as A, fixed to the upright timber or standard A E." The further features of the fan are evident from the illustrations, and the extremely small inlet, or "Sucking-pipe," as Desaguliers calls it, is particularly noticeable.

The first suggestion of the blower system appears to lie in his remarks that "this machine would be of great use in all hospitals, and in prisons; it would also serve very well to convey warm or cold air into any distant room." He suggests that the air might be perfumed, but gives no hint as to how he would warm it. Here, then, appears to be the first recorded intimation of a method of heating by which warm air was to be forced by a fan to the designated apartment. How far, if at all, this idea was put into practice it seems impossible to ascertain at this day. But it is certain that the fan which he introduced in the House of Commons in 1736 was employed for exhausting only, was operated by hand, and was practically independent of the method of heating.

In the year 1758 there was published in London a quaint volume entitled "A Treatise on Ventilators, By Stephen Hales, D.D., Clerk of the Closet to her Royal Highness the PRINCESS OF WALES, F.R.S., and Member of the Royal Academies of Sciences at *Paris* and *Bolognia*." This work, which in the now curious diction of its author runs all the way from morals to mechanics in the consideration of the subject, bears upon its title page

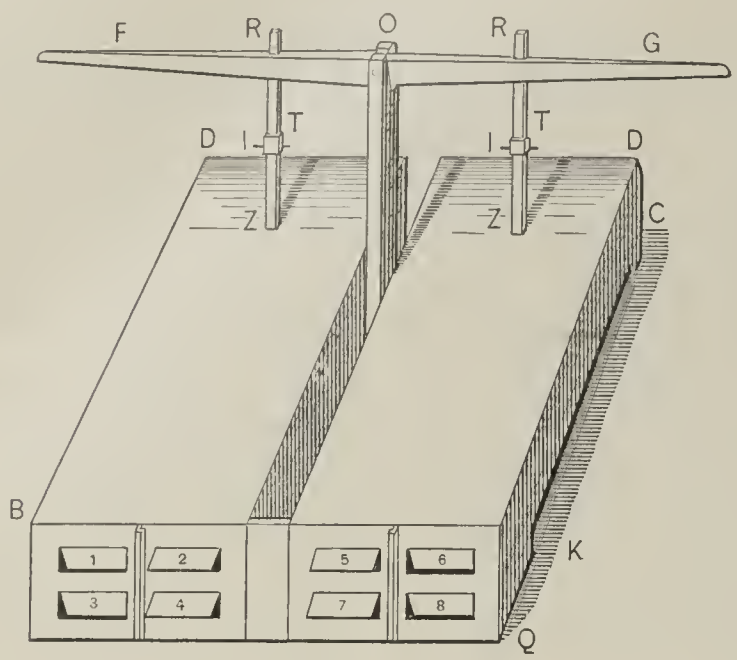


Fig 4.

the statement—whose character warrants its reproduction—that

"An account is given of the HAPPY EFFECTS of Many Trials that have been made of them; which has occasioned their being received with general APPROBATION and APPLAUSE on account of their UTILITY in many ways, to the great Benefit of Mankind, *viz.*

"In refreshing the NOXIOUS AIR of SHIPS, HOSPITALS and MINES to the better Preservation of the Health and Lives of Multitudes,

"In preserving the TIMBERS of SHIPS Much longer from decaying,

"In easily sweetening stinking CASK WATER and curing the ill Taste of MILK, from some food of COWS,

"In new Methods of distilling Plenty of good water at SEA,

"In refreshing the air and keeping up and regulating, the Warmth of Melon and Cucumber Frames, and Hot Houses,

"And in several other useful IMPROVEMENTS."

This account is, in fact, a reprint of a paper presented by the reverend gentleman at a meeting of the Royal Society on June 9, 1743, and from this date we must reckon the inventions which he describes.

The wonderful means of increasing human happiness which he describes is nothing more nor less than a double bellows, of which one form, reproduced from one of his illustrations, is presented in Fig. 4. This huge bellows was arranged to be worked by two men, one at either end of the handle bar. The arrangement of valves was such that air was pumped both by the upward and downward action of the handles. That he realizes the lack of novelty in the application of the bellows on a large scale for the movement of air is evident from his reference to the much earlier work of Agricola, in which are described bellows arranged to be operated by water or horses. He, however, claims an improvement because of the construction of his machine.

Although the hygienic advantages of ventilation were realized in that day, yet the meagerness of the ventilation proposed is vividly presented by such remarks as

"If the Air of Hospitals were changed every Day, Morning and Evening, for a little Time, so as not to have Time to putrify, it is probable many Patients would recover sooner, and that fewer would die in such purer air."

The first trial of Dr. Hale's ventilators in a hospital was made in the county hospital at Winchester, England. The diaphragms were each 7 feet long and 3 feet broad. The air was drawn out of the ward through a large trunk reaching nearly up to the ceiling, in order that the patients might not be incommoded by the velocity, which Dr. Hales asserts was "so great as to twirl fast round a little wind mill placed at the Mouth of the Trunk." This twirling wind mill was more than a mere ornament, for it was "found to be of considerable use in diverting, and thereby encouraging those who work the ventilators to persist in working; without which sensible amusement they are apt to be discouraged." Can one wonder that under these conditions of motive power ventilation at morning and evening should have been deemed sufficient? The chilly comfort of a hospital of those days is evidenced by a report of the effect upon the temperature resulting from the operation of these ventilators. Upon a December day the conditions were as follows:

	Degrees.
External air above freezing	4
In the ward	18
After ventilating 5 minutes	17
After ventilating 10 minutes	15
After ventilating 15 minutes	15

These ventilators were applied in a number of hospitals, on shipboard, and in buildings of varied character, in some cases a wind mill being provided to operate the bellows. They were also introduced for creating a circulation of air in the drying of salt, grains, malt, clothing, &c.

In this connection appears the first practical application of the idea of forcing warmed air, which was suggested by Dr. Desaguliers. Dr. Hales describes a box a foot square, with a bottom of canvas, which was filled with gunpowder. Under this

"Was fixed at the Hole in the Side of the Box the upper part of a Worm-pipe of a distilling Worm Tub, which was filled with twenty-two gallons of boiling hot water. To the lower End of the Worm-pipe was fixed the hose of a common pair of Kitchen Bellows, whose lower Handle was strapped down with a Piece of Leather to the Board on which the Blower sat, by which means the Bellows were worked with great Ease. The heat of the Air which came through the Worm-pipe was 150 Degrees, 212 of which is the Heat of boiling Water; so that it was very near three-fourths of the Heat of boiling Water. And having placed a mercurial Thermometer in the Powder I could observe how the Heat increased Still more as it dried; so that at the End of Two Hours the Heat was increased to 120 Degrees."

The general external form of the worm tub described and illustrated by Dr. Hales is presented in Fig. 5. Upon a larger scale 50 pounds of gunpowder was dried, the ventilator being of the midriff form, and the suggestion is made that it might, if near a stream, be driven by water power, and further that there is in this idea "a

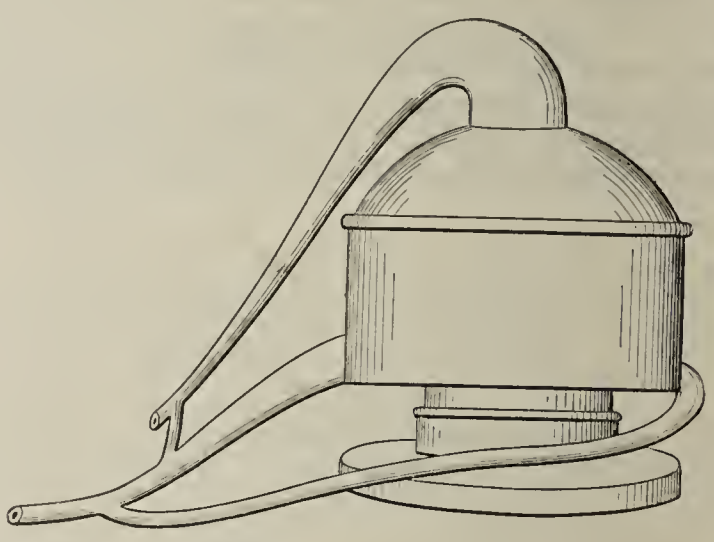


Fig. 5.

Hint for drying several kinds of Things, as Corn, &c., without communicating to them any Fume of Fire, *viz.*, by conveying plenty of hot dry air among them by means of a large Worm-pipe fixed in a large caldron, when a small fire would keep the water in a constant Scalding Heat . . . the hot air to be impelled through the Worm-pipe by Ventilators of proper size."

Dr. Hales further suggests that "Ventilators might also be of use to those who wash large Quantities of Linen in great Towns, if the Linen were hung in low, long, narrow Galleries."

THE PENNSYLVANIA MASTER PLUMBERS AT PITTSBURGH.

On Tuesday, March 15, at 10 o'clock a.m., in the banquet hall of the Monongahela House, Pittsburgh, Robert Drummond, president of the Pennsylvania Association of Master Plumbers, called their fourth annual convention to order. About 40 delegates were in attendance at the opening session, and this number was considerably increased later in the day. S. Louis Barnes of Philadelphia was secretary. John M. Addy of the East End, Pittsburgh, on behalf of the master plumbers of Pittsburgh and Allegheny, welcomed the delegates and explained briefly the topographical advantages of Pittsburgh, and also the position of that city in the iron, steel, coal, natural gas and other industries. The remarks of Mr. Addy were extremely interesting and were closely listened to by the delegates. President Drummond responded to the address and the business of the convention was fairly opened.

The first business transacted was the appointment of a Committee on Credentials, as follows: J. B. Doyle, Scranton; Frank J. Gray, Pittsburgh, and John S. Leslie. The chair also appointed Chas. F. Bradshaw sergeant-at-arms and G. Wallace Smith reading clerk. An Auditing Committee was also appointed, consisting of G. Wallace Smith, Philadelphia; W. H. Williams, Braddock, and O. L. McCartney, Altoona. Letters of regret were read from S. L. Malcolm, vice-president of the National Association, and W. E. Goodwin of Milwaukee, treasurer of the National Association On motion the further reading of letters from delegates and others unable to be present was dispensed with. The Committee on Credentials having completed their work, reported the following delegates in attendance:

J. H. Birchall, Allentown, Pa.

Martin Foster, O. L. McCartney and G. R. Stone, Altoona, Pa.

W. J. Butler, M. J. Campbell, J. H. Lyons and F. J. Miller, Erie, Pa.

O. H. Tebay, Leechburg, Pa.

H. R. Dunlap, New Castle, Pa.

S. Louis Barnes, W. S Clark, William H. Doyle, Robert Drummond, M F. Elliott, John E. Eyanson, Joseph V. Reagan, Samuel H. Ritch and G. Wallace Smith, Philadelphia.

John M. Addy, C. F. Bradshaw, Chas. Craig. H. Schlemming, Thos. Chipp, John Colling, W. H. Williams, G. D. Deedy, F. J. Gray and Jos. G. Weldon, Pittsburgh.

Jas. B. Doyle, Jos. Evans, T. F. Mullen and John Nolan, Scranton, Pa.

P. W. Bell, Shenandoah, Pa.

A committee was also present representing the Northwestern Plumbers' Association, consisting of Thos. Stone, M. C. Judd, John S. Leslie and F. D. McCue. In addition to the above a few other delegates were present whose names were not secured by the committee. Following the report of the Committee on Credentials the report of the Sanitary Committee, consisting of John S. Leslie, Fred. S. Miller and O. L. McCartney, was presented and was as follows:

REPORT OF SANITARY COMMITTEE.

The science of sanitary plumbing has well been placed next to that of medicine, and the profession of sanitary plumber as second only to that of the medical man in the preservation of health, without which "life is not worth the living." Many plumbers do not realize the great benefit which they can be to humanity by doing their work in a scientific and sanitary manner, many caring only to do the work absolutely necessary without a care for the result from a sanitary view. He seems to care only for the money to be made from the one system then being installed, and nothing for the health of those made to innocently suffer disease and possibly death on account of his neglect or willful deception, while he realizes not that he is responsible in at least this one way for his brother's keeping, though he should be responsible in the eyes of the law also. Others there are who fail to do their work properly on account of lack of knowledge but there is to-day a growing demand for sanitary plumbing, the people of all classes are becoming educated to realize the great importance of sanitary plumbing, and the educated sanitary plumber is the one who will succeed in the future. The uneducated plumber can only be made to realize the responsibility devolving upon him by education. The dishonest plumber, does only what is absolutely necessary to fulfill specifications by compulsion. To protect the public from this latter class was one of the objects of the laws of this and other States, requiring Boards of Health of all cities and towns having systems of water works or sewerage to pass rules and regulations compelling all persons engaging in the plumbing business to qualify for such work, and to install all plumbing work according to rules established with the view of obtaining the best possible sanitation. Many of our cities and towns receive practically no benefit from their Boards of Health, they having become merely berths for some petty politicians, and having rules and regulations that, instead of governing the work intended, in a manner just to all, have loop holes through which favored partisans can and are permitted to escape. Many of the Boards of Health of the smaller cities and towns are practically dead, the rules laid down by possibly some former more active board being null and void as far as the present board is concerned, and the public suffer in consequence. Some of our members complain that persons not qualified to practice the art of plumbing are ruining their business by doing cheap and consequently poor work in their locality. If these members took but a few moments to consider, they would see that the trouble lay partly with themselves and was certainly within their reach. If they would see to the organization of the Board of Health, and see that the members of same were chosen for their fitness for the position and knowledge of sanitation, the trouble would to a great extent be remedied. Do not allow some ward politician to have a good member of the board or inspector removed to make place for some one to whom he owes a favor, unless such person knows at least something about the first principles of sanitation. When you get the proper kind of people on the Board of Health, there is not a city or town in this commonwealth where the plumbers cannot have the boards make proper rules and regulations for plumbing work if they so choose. Our State laws require that they shall make such rules, and it is our duty to see that they do so. Bring the Board of Health to see that the public welfare demands the best possible sanitary plumbing, and have rules formulated which will compel workmen to do their work in a scientific manner, and you will be rid of the incompetent competitor, the standard of work will be elevated, the result will redound to the advantage and credit of the citizens of your community, but in a much greater degree will it redound to the advantage of the legitimate sanitary plumber. Your committee, in submitting their report, beg to suggest that some means be devised for impressing upon Boards of Health throughout this State the necessity for the promulgation of suitable rules and regulations for the government of plumbing where such do not now exist, and in all cities or towns where suitable rules are now in vogue or may hereafter be established we respectfully urge upon our members the duty which they owe to their fellow citizens of seeing that such rules are enforced, inasmuch as they themselves will receive the greater benefit.

The reading of this paper brought about considerable discussion, participated in by a number of the delegates, after which it was referred to a special committee for further action. The reports of the officers for the year were then read, that of President Drummond being presented first. In his paper the president reviewed the work of the association for the past year, and made a number of suggestions which he believed, if carried out, would be of considerable benefit to the association. S. Louis Barnes, secretary, then made a brief report showing the condition of the association. The report of John H. Birchall, treasurer, was then read, showing the receipts from all sources for the entire year to have been $1205.14, expenditures $901.04, leaving a balance in the treasury of $304.10. After the reading of the reports of the officers the association went into executive session until about 12.30, when an adjournment was had for lunch. This was provided by the master plumbers of Pittsburgh and Allegheny, and was thoroughly enjoyed by the delegates.

The association reconvened in executive session about 2 p.m. At the afternoon session matters of considerable importance were under discussion, in which nearly all the delegates took part. Among matters considered were the relations of the master plumbers to the plumbers' supply houses and also to the manufacturers. The afternoon session was undoubtedly most interesting and beneficial, and a number of suggestions were made which if followed out will no doubt be of considerable benefit to the members. During the afternoon the Auditing Committee appointed at the morning session made its report, finding the ac-

counts of the treasurer absolutely correct, and the committee was discharged with thanks. The election of officers for the ensuing year took place and resulted as follows:

President, Frank P. Blythe, Pittsburgh.

Vice-Presidents, Jas. B. Doyle, Scranton; M. J. Campbell, Erie, and John S. Leslie, Sharon.

Secretary, Jos. A. Weldon, Pittsburgh.

Treasurer, John H. Birchall, Allentown.

Delegates at Large, S. Louis Barnes, Philadelphia, and Robert Drummond, Philadelphia.

The convention next year will be held at Scranton, Pa. After the transaction of some other routine business the convention adjourned. In the evening a banquet was held at the Monongahela House, tendered by the Master Plumbers' Association of Pittsburgh and Allegheny. Representatives of various manufacturing and supply houses and the plumbing inspectors of Pittsburgh and Allegheny were present by invitation. John M. Addy of Pittsburgh was toastmaster. Toasts were responded to as follows: By Joseph Weldon, Pittsburgh, on "Our Country;" Thomas Stone, Greenville, "Our National Association;" Francis J. Torrance, Allegheny, "Plumbers' Enameled Goods;" Robert Drummond, Philadelphia, "Our State Associations;" James Hay, Allegheny, "National and State Associations; Manufacturers and Jobbers in Their Relation to Master Plumbers and Consumers;" W. T. Taggart, Pittsburgh, "Inspection of Plumbing;" S. Louis Barnes, Philadelphia, "Local Associations;" Joseph V. Reagan, Philadelphia, "Local Memberships;" Joseph Evans, Scranton, "Sanitary Plumbing;" W. S. Clark, Philadelphia, "The Plumbers of To-day;" Joseph B. Doyle, Scranton, "The Ladies." The banquet was thoroughly enjoyed, the festivities continuing until a late hour.

On Wednesday, through the courtesy of the Standard Mfg. Company of Pittsburgh, manufacturers of plumbers' and enameled goods, a steamboat excursion was taken, the route being up the Monongahela River past Braddock, Homestead, Duquesne and other important manufacturing centers. On the return trip the boat went down the Ohio River as far as Davis Island dam and then returned to the landing at the works of the Standard Mfg. Company, located on Preble avenue, Allegheny, Pa., where the delegates were taken in charge by members of this concern and shown through every part of their establishment, said to be the largest in the world devoted to the manufacture of enameled baths and plumbers' goods. The trip was thoroughly enjoyed by the delegates, the return to the Monongahela House being made about 6 p.m. The convention will go on record as being one of the pleasantest yet held by the Master Plumbers' Association of Pennsylvania.

New York State Steam Fitters.

The third annual convention of the Master Steam Fitters' Association of the State of New York was called to order at 3.30 o'clock March 8, in the Bennett, by President William N. Tobin of Syracuse. Secretary Wm. F. Quinn of Troy read the minutes of the last annual meeting, in Rochester. The president presented a brief report, and Secretary Quinn reported that as yet the New York and Buffalo local unions had not affiliated with the State organization, and said that without them the organization was imperfect.

A resolution was adopted that it was the sense of the meeting that the National Association be requested to so amend their constitution that the New York and Buffalo locals shall be forced to join the State Union, or else the State Union would withdraw from the national organization. The following committee was appointed to bring this matter to the notice of the national organization: John A. Creelman of Rochester, W. H. Gaylord of Binghamton, John H. Sadler of Elmira, W. N. Tobin of Syracuse and W. F. Quinn of Troy. The present officers were continued until after the meeting of the National Association in New York in June, when the course of the State organization will be decided upon. The officers are: President, Wm. N. Tobin, Syracuse; vice-president, John A. Creelman of Rochester; secretary, Wm. F. Quinn of Troy; treasurer, P. C. Dougherty of Poughkeepsie.

Delegates were present from Rochester, Syracuse, Auburn, Troy, Albany, Binghamton, Elmira, Poughkeepsie and Lansingburg.

A New Low Down Self Closing Basin Cock.

In the accompanying illustration we show a new low down self closing basin cock, made under the Broughton patent by the E. Stebbins Mfg. Company, Brightwood, Mass. It will be noticed that this faucet is arranged to set down on the slab to which the lavatory bowl is attached, so as to present no considerable obstruction to a free use of the lavatory. The faucet is made in two styles, one arranged to be operated with a ball wheel, as shown, and the other to be operated by means of a yoke lever attached to the spindle which works the cock. The cocks are adapted to stand high pressures, are said to be made of first-class material and are furnished in brass, nickel or silver plate, and also in solid silver metal. A circular describing these cocks and giving prices can be secured on application.



A New Low Down Self Closing Basin Cock.

Rival Associations.

A committee of 30 select members from the Master Plumbers' Mutual Protective Association of Baltimore, Md., visited Governor Lowndes last week, bearing a numerously signed petition recommending the appointment of James Robinson, Henry D. Koethe and John A. Wilson as the new Board of Commissioners of Practical Plumbing. The board, as suggested, is the same as the present, with the exception of John A. Wilson. He is indorsed as the successor to Henry Kerr, who declines reappointment. The action of this association is in opposition to the Master Plumbers' Association of Baltimore, which has given its support to George Nipp and Richard Caruthers. The former association claims that the board, as at present constituted, has proven itself so pre-eminently fair and impartial to all persons engaged in the plumbing business that their conduct has elicited marked commendation.

There is said to be a steady and growing demand for small sized Wrought Iron Pipe from Great Britain. Several carloads have been shipped there from New York in the past few weeks. Another branch of trade which is developing with Europe is that in Brass Valves and Fit-

tings of American manufacture. Shipments of these goods are being made thither weekly.

California Master Plumbers.

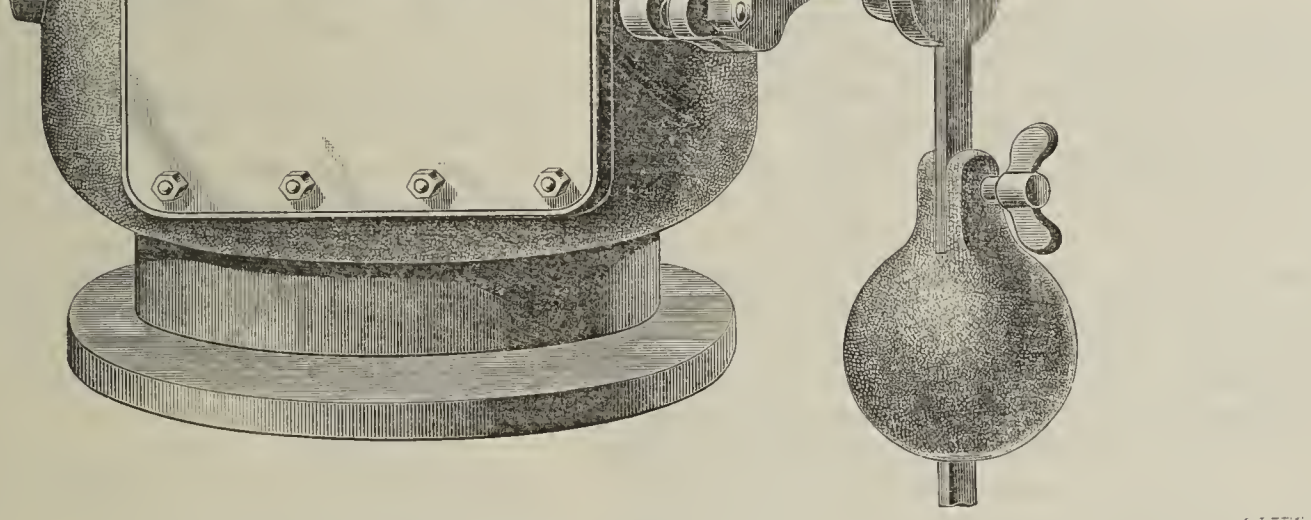
The State convention of the Master Plumbers' Association of California will be held in Los Angeles on March 23, and there will be from 150 to 250 delegates from all parts of the State in attendance.

The association will, it is said, endeavor to secure the convention of the National Association of Master Plumbers, which meets this year in San Antonio, Texas, for Los Angeles in 1899.

To this end the local association will send to San Antonio L. A. Scholes, J. H. Parker, T. J. Stephens, W. P. Vandegrift and Thomas Hooker as its representatives, and John Crimmins, vice-president of the State association, and C. T. Paul, president of the local association, both residents of Los Angeles, will accompany the delegation.

A Noiseless Back Pressure Valve.

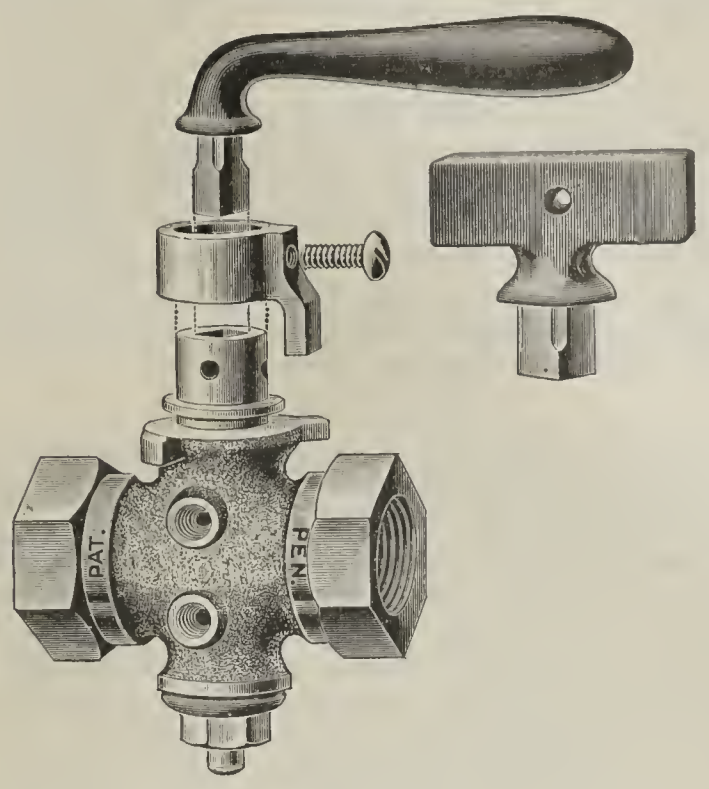
In the accompaning illustration we show a new noiseless back pressure valve which is being placed on the market by the Judson A. Goodrich Company, 120 Beekman street, New York, as one of their high grade steam specialties. The construction is such that it can be used either vertically or horizontally, and the valve is of the piston type, controlled by eccentric connections, so that a very small weight is all that is required, and a counterbalance may be connected with the lever when necessary. The area of the valve is full size of the steam pipe, and, being made of the best bronze metal, it is claimed it will not stick or corrode. The valve can be adjusted to a few ounces or atmospheric pressure by the adjustment of the weight on the lever. By removing the face plate shown the internal parts of the valve, which are very simple in arrangement, can be entirely removed for any attention that may be necessary. When needed for condensing engines for vacuum systems the valve is made to close on a seat. It is made in all sizes, from 2 inches to 16 inches. A circular giving full particulars, dimensions and prices can be secured on application.



A Noiseless Back Pressure Valve.

Anti-Freezing Stop and Waste Cock.

In the accompanying illustration we show Lyon's patent anti-freezing stop and waste cock, manufactured by the Cleveland Bronze & Brass Works, 1144 Hamilton street, Cleveland, Ohio. In Fig. 1 we show the stop and waste cock as used for iron pipe and in Fig. 2 as used with lead pipe. It is stated that the cocks are made of the best material and are ground into the seats. They are tested under a pressure of 250 pounds. A feature which is pointed out is that the cock will drain pipes without opening any of the cocks on the fixtures, owing to the vent provided for the purpose of admitting air. It has two waste holes, as shown, allowing the air to enter the pipe to occupy the space from which the water is to be emptied. Another point is the simple mode of changing the stop cock from right to left or *vice versa*, it only being necessary to withdraw the screw about ¼ inch and slide the ferrule around to the proper place, then screw up tight again and the waste is changed, so that the cock can be reversed under pressure without removing the clamp or handle. The construction admits of the use of either a lever handle or a key to be operated by a wrench, as preferred. It is also pointed out that the waste holes cannot



Anti-Freezing Stop and Waste Cock.—Fig. 1.—Stop for Iron Pipe.

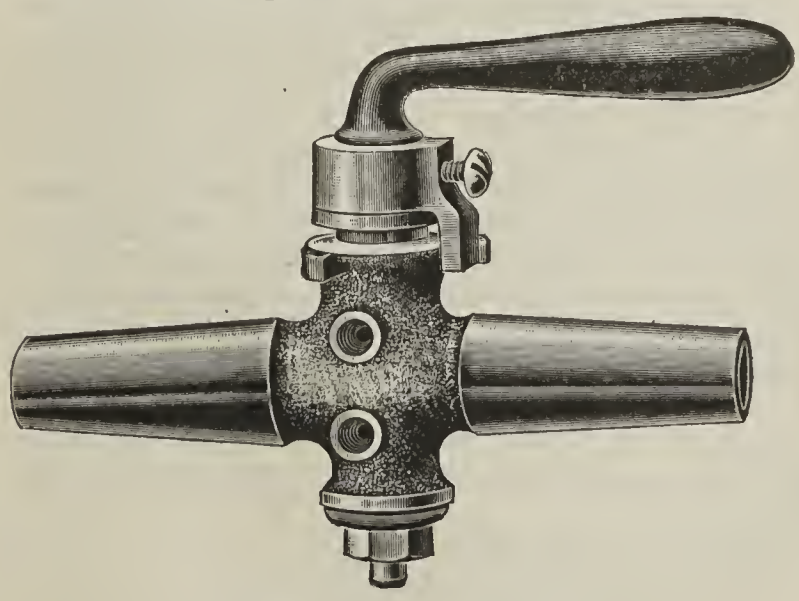


Fig. 2.—Stop for Lead Pipe.

be turned to the live water side. Circulars giving full information can be secured on application.

NATIONAL DELEGATES.

NEW YORK STATE.

At the convention of the New York State Association of Master Plumbers, at Binghamton, N. Y., last week a resolution to form an Eastern League of the plumbers' associations in the Eastern States was adopted and the following delegates to the national convention were elected: Jonas Rossman, New York; W. G. Reid, Rochester, and Horace F. Westcott, Albany.

PHILADELPHIA.

The Master Plumbers' Association of Philadelphia has elected the following delegates to represent the Philadelphia Association at the sixteenth annual convention of the National Association of Master Plumbers, meeting at San Antonio, Texas, April 13, 14, 15: S. Louis Barnes, J. E. Eyanson, F. P. Brown, E. H. Mackay, R. Drummond, George F. Uber, S. B. Fleming, W. McCoach, W. L. Owens, L. J. Sommers, A. M. Hicks, D. R. Burns, A. G. Bond, M. Thompson, J. J. Furlow, M. F. Elliott.

NORTHWESTERN PENNSYLVANIA.

At a meeting of the Master Plumbers' Association of Northwestern Pennsylvania, held at Sharon, Pa., March 10, William McCormick of Sharon was elected a delegate to the national convention at San Antonio, Texas, in April.

WASHINGTON, D. C.

The following members of Washington Master Plumbers' Association, Washington, D. C., were elected delegates and alternates to the annual convention of the National Association, to be held at San Antonio, Texas.

Delegates: Wm. Koch, Ed. J. Hannan, Daniel Hannan, James Ragan, Joseph R. Quinter, Charles Barrick.

Alternates: D. J. Murphy, R. A. Beuchler, A. S. Dent, John Gaghan.

BALTIMORE DELEGATES.

The annual meeting of the Master Plumbers' Association of Baltimore, Md., held in the Builders' Exchange Building March 10, elected the following officers and delegates: P. T. Barry was elected president; J. J. Pirie, first, and Lloyd Mitchell, second vice president; George W. Addison, recording secretary; Chas. H. Frederick, financial secretary, and Daniel N. Sullivan, treasurer. Delegates to the national convention, which meets in San Antonio, Texas, April 13: John Trainor, Lloyd Mitchell, P. T. Barry, P. N. Sullivan, J. C. Mitchell, C. H. Frederick, August Eidman, Allen W. Beam, J. S. P. Carey, D. N. Sullivan, H. C. Bowman, William Dunnett, John A. Graham, J. J. Pirie, A. Stidham and Walter W. Rowles; alternates, James J. Connolly, Martin Delaney, Charles Clifford, A. G. Hassel, Samuel Bennett, W. J. McCrea and Joseph B. Harig.

CONNECTICUT STEAM FITTERS.

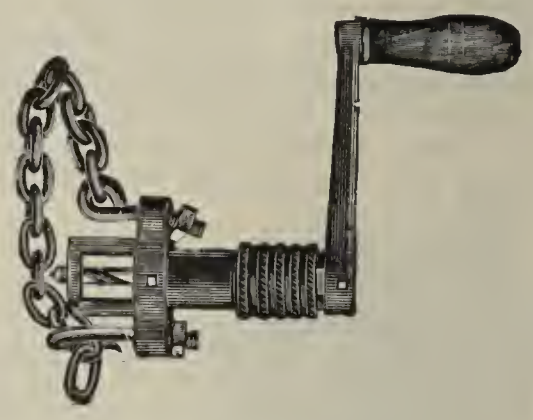
The annual convention of the Connecticut State Association of Master Steam and Hot Water Fitters was called to order by National State Vice-President S. E. Dibble at the Builders' Exchange, at New Haven, Conn., on Wednesday, March 16, with a good attendance. National President E. D. Smith of New York addressed the convention on the benefits of the association and National Secretary Henry B. Gombers explained the duties of the officials. The treasurer's report showed a financial condition which allowed the dues to the State Association to be remitted for the year. The Committee on Constitution and By-Laws reported progress, and S. H. Beard was appointed to fill a vacancy on the committee. After disposing of the regular business the following officers were elected:

President, John Creedon, Hartford.
Vice-President, John M. Page, Naugatuck.
Secretary, S. H. Beard, New Britain.
Treasurer, S. E. Dibble, New Haven.
Executive Committee: F. A. Curtis, New Haven; M. J. Daly, Waterbury, and Wm. Vanderman, Willimantic.

After the convention S. E. Dibble entertained the National and State officers at an informal 5 o'clock lunch.

The Porter Power Hand Drill.

A portable drill, which is herewith illustrated, has just been placed on the market by the J. E. Porter Company, Ottawa, Ill. The cut shows the drill as used for boring pipe, but it is adapted to a great variety of work in drilling metals. It can be adjusted to handle any size of pipe, and is held solidly to its work by a heavy chain. It is fitted with a universal chuck, which will hold a drill of any size up to 1 inch. The crank is worked with one hand, while the feed is operated by the other. The feed



The Porter Power Hand Drill.

is produced by a screw, which in connection with the crank enables drilling to be done very rapidly. One size is made at present, weighing about 10 pounds.

NOTES.

A firmer tone is apparent in almost all lines of Plumbers' and Steam Fitters' Supplies. Galvanized Iron Range Boilers have made a slight advance during the week, as noted in our trade columns. A further advance in these goods is looked for in the near future and an announcement of higher prices is also expected in Plumbers' Brass Goods at an early date.

In Wrought Iron Pipe prices are stronger and there has been a fractional advance in retail quotations, particulars of which will be found elsewhere in this issue. The current demand for Pipe is referred to as fairly active. The mills are all busy on orders and the outlook in this department is regarded cheerfully.

The Bradley & Hubbard Mfg. Company of Meriden, Conn., have the contract for the gas and electrical fixtures for the new Hotel Winchester, at Winsted.

The Sewer Committee of Meriden, Conn., has recommended that new sewers be built, which will aggregate 24,000 feet in length.

Isaac Teasdale, New Haven, Conn., has moved his place of business to one of the new stores in the Pitkin Block on Pitkin and Orange streets, where he is prepared to contract for heating work.

Joseph E. Stannard, for many years in the employ of Curtis & Pierpont, has opened a store on Whaley avenue, New Haven, Conn., and is prepared to do a general tinning and heating business, making a specialty of sheet metal work.

Taylor & Nichols, Bridgeport, Conn., have removed their plumbing establishment to 50 Cannon street.

P. H. Abbott of M. Abbott's Sons, heating contractors, 137 Eighth avenue, New York City, is combining business with pleasure at Atlantic City, N. J.

A letter from G. A. Richards, president of the Master Plumbers' Association of Grand Rapids, Mich., informs us that L. Semeyn has succeeded to the plumbing business hitherto conducted by Henry Griffin.

Lowden Steam Regulator Company have been organized at Portland, Maine., for the purpose of manufacturing and dealing in machinery and fixtures used in light and heat plants, with $25,000 capital stock. The officers are: President, James J. Lowden of Everett, Mass.; treasurer, A. L. Delesdernier of Boston, Mass.

The Stockholders' Committee of the Peck Brothers' Company, New Haven, Conn., have levied an assessment of 15 per cent. on the stock held by the stockholders. The money raised, it is understood, will be used to form a working capital for the new company. The assessment will put $90,000 into the hands of the stockholders with which to run the factory.

The certificate of incorporation of the Walker Bros. Plumbing Company of Denver, Colo., with a capital stock of $10,000, has been filed with the Secretary of State by F. W. Walker, H. A. Walker and Nellie E. Walker.

Two meetings have been held by 15 or 20 plumbers of Cleveland, Ohio., outside of the master plumbers' organization, for the purpose of forming an organization of their own.

D. R. McCallum of the Novelty Iron Works, Canton, Ohio, was in New York this week in the interest of their line of Steam and Hot Water Heating Boilers.

Dr. Leavitt, chairman of the Board of Health ; E. J. Ryan, master plumber, and George Carson, the journeyman member of the Board for the Examination of Plumbers of Danville, Mass., are conducting the examination of plumbers in that city.

An attractive catalogue is published by Russel Wheeler & Son, Utica, N. Y., in the interests of their Palace Regent Safety Solid Heaters for steam and hot water. This boiler, which was illustrated in *The Metal Worker* of March 5, is completely shown in the catalogue in question by general, sectional and broken views of the steam and water types. The Steam Heaters are made in eight sizes, with grate area from 12 x 12 to 20 x 36 inches, adapted to supply from 150 to 750 square feet of radiation. The Hot Water Heaters with grates of similar area are made in eight sizes also and adapted to supply from 225 to 1125 square feet of radiating surface. Special illustrations at the end of the catalogue show the smoke bonnet and check draft door, also the ash pit and grate used with these Heaters. The catalogue is bound in dark colored paper with gilt side title and trade-mark. while the 16 pages within are of fine paper, bringing out perfectly the excellent halftone engravings of the apparatus.

The United States Radiator Company, West Newton, Pa., are about to erect a new foundry, 100 x 50 feet, and a machine shop of similar dimensions.

A letter from John Gormly, 1433 Columbia avenue, Philadelphia, Pa., informs us that he can make it profitably interesting to any man who can aid him in collecting an indebtedness of about $1500 from an absconding debtor.

Thomas P. Collins has opened a plumbing shop in Shaw's Block, 425 High street, Medford, Mass.

Colvin & Hause have opened a plumbing establishment on Front street, Melton, Pa.

The plumbing establishment of Walter T. Perkins, at Dover, N. H., was destroyed last week by fire, the loss being partially covered by insurance.

The establishment of Matthews & Dubson Mfg. Company., Royersford, Pa., manufacturers of tinners' and plumbers' supplies, was destroyed by fire last week at a loss of $8000, which was covered by insurance to the amount of $5000. The plant will be rebuilt as soon as the loss has been adjusted.

L. E. Ballou, Enfield, Mass., is about to move his plumbing establishment to the store formerly occupied by Howe Brothers.

The Edward J. Brandt-Dent Company, Watertown, Wis., have issued a very neat catalogue and price-list of staple dipped and polished Gas Brackets and Pendants, standard staple brass Gas Fixture Fittings and related goods. It is interleaved throughout with blank pages for memoranda.

"The First Shot" is attached by a string to a card sent out by W. S. Haines, 136 South Fourth street, Philadelphia, referring to the Heintz Steam Trap.

J. O. Wilson, 92 Walker street, manager of the New York office of the R. M. Wilson Mfg. Company, Rome, N. Y., is displaying one of the Mohawk white enameled cast iron Bathtubs in his show window, decorated with a wide gilt band.

W. M. Mackay, 235 Water street, New York, the manager of the steam and hot water department of the Hart & Crouse Company, Utica, N. Y., was one of the prominent persons at Washington, D. C., this week.

Treasurer Wm. T. Isaac of the Gurney Heater Mfg. Company. Boston, Mass., visited I. G. James, manager of the New York office, at 48 Centre street, and presented him with an advance copy of the new Doric Steam and Hot Water Heaters, which will be of interest to the heating trade. The company have recently issued a card giving notice of the removal of their Boston office to much larger and convenient showrooms at 74 Franklin street, where they intend displaying their complete line of Steam and Hot Water Heaters and Radiators. A souvenir of the change is a convenient little book which gives a complete calendar for 247 years, from 1753 to 2000.

Tyler & Conant, dealers in Agricultural Implements, Pumps, Fittings, &c., Bangor, Maine, have been succeeded by C. M. Conant Company.

Fred. Bangs of Brewer, Maine, has opened up a Hardware and plumbing business in Harmony, Maine.

The rear store of the J. M. Ives Company, Danbury, Conn., was burned out a short time ago, and the company are doing business in the main store. They are no longer interested in plumbing and heating, having disposed of this branch of their business to the Danbury Hardware Company.

Trustees of the Presbyterian Church, at Williamsport, Pa., have selected a Gorton Boiler to take the place of a Boiler which was recently destroyed by accident.

Defective Plumbing.

The following comments on the evils of defective plumbing and the means of preventing it are made by a Hoboken paper and are opportune, as a bill for the regulation of plumbing is now before the New Jersey State Legislature. After calling attention to the existence of defective plumbing, the writer says:

The reason can be readily arrived at—incompetent plumbers. When the only necessary qualification for license in this city is that a man shall be known to the Water Commissioners as a plumber (good, bad or indifferent), and can get some landlord to go on a bond for so many dollars—a bond not to protect the property owners in case of unsanitary work, but the city and Water Commissioners, for any accident which occurs through the licensee's negligence in opening and filling in street and sidewalk ditches—what else can be expected ?

There is no law or penalty which can be enforced against incompetent men for doing plumbing work. What we need in this city is a legislative enactment compelling applicants for licenses in the plumbing business to submit to an examination before a committee composed of members of the Board of Health and practical plumbers of undoubted integrity and some knowledge of sanitary science. If successful, the committee to grant a certificate of competency, fortified with which the applicant can then appear before the Water Commissioners and proceed in the regular manner required and take out the license they demand. If unsuccessful in examination no license should be granted. The community would be the better off.

Plumbers licensed at the present time should also be made to take the examination. The fact of a man having spent a number of years at the plumbing trade as a journeyman and boss should not exempt him. People who have been botching work all their trade days will still continue to do so. Some through ignorance and some through greed. Journeymen plumbers should be registered at the office of the Board of Health also.

There is a code of rules or laws or something or other relating to the plumbing business issued by the Board of Health of Hoboken, which seems to be ineffective, as conviction and the infliction of a penalty seem impossible under it. There should be penalties attached and means to enforce them for violating the above which would deter people from practicing the plumbing business (or profession), such, for instance, as are prescribed in the cases of physicians and dentists.

It is announced that the annual convention of the National Association of Credit Men will meet in Detroit, Mich., in the latter part of June.

The United States Consul at Ningpo, China, in a report to the State Department says that vast untouched beds of sheet mica lie within 50 miles of Kiao-chow Bay. The extent of these mica deposits is as yet unknown; but, so far as he has investigated, they promise to handsomely repay those who are fortunate enough to obtain a franchise for working them. The rolling, sandy hillocks, under which the mica lies, are but poor lands for cultivation, and hence their use for mining purposes detracts nothing from the cereal producing capacity of the region. The mica crops out at intervals over some 50 square miles, and in veins sometimes 10 feet thick. Of course, much of it is discolored by foreign minerals, but what he has seen assures him that there are vast quantities of good commercial material.

A press dispatch from Grand Encampment, Wyoming, reports the discovery of a rich deposit of mica in that vicinity. The croppings of the vein are exposed on the surface 50 feet wide and 200 feet long, and the mica taken out is said to be in blocks ranging from 8 to 12 inches square and of a clear white color. Arrangements are being made to begin workings on the property.

Thirty-five States, so far, have agreed to participate in the Trans-Mississippi Exposition at Omaha. All of them will, it is expected, place important State exhibits.

THE RETAIL STORE.

The Erie Gas Range.

In the accompanying illustrations we present views of two styles of the Erie gas range, which has just been



The Erie Gas Range.—Fig. 1.—Range with Two Improved Burners in Top Surface and Special Burner Under Oven.

brought out by the Griswold Mfg. Company of Erie, Pa. In Fig. 1 of the illustrations is shown the range with two improved burners in the top and a special burner under

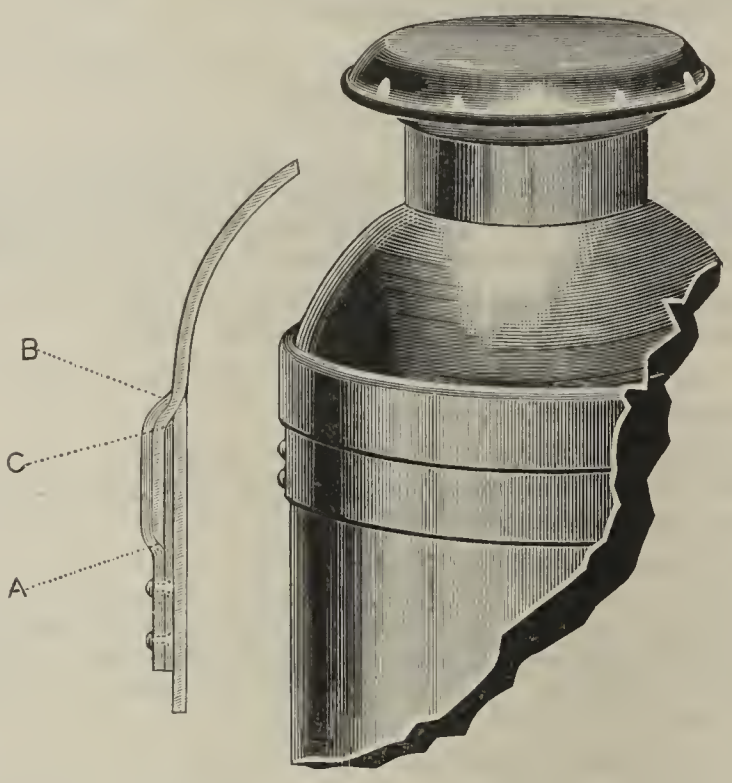


Fig. 2.—Erie Range with Broiler.

the oven which is movable for lighting. The range has wrought iron frame neatly japanned, nickel plated supply pipe, cocks and name plate, planished sheet iron oven, tin lined, and a strong catch on the door. The range stands 31 inches in hight, and has a top measuring 25 x 14 inches. The oven inside is 19 inches long, 12½ inches deep and 12½ inches high. In Fig. 2 is shown a view of the same stove, but having in addition a broiler. In this case the range is 33 inches high, with same size of top and oven as indicated in connection with the range shown in Fig. 1. The size of the broiler, inside measurement, is 12 x 15 inches. The company have issued a very neat illustrated catalogue and price list showing several views of this range, some of the sizes having three and others four burners in the top surface. Attention is also given to Erie, Liberty and Victor hot plates, Erie ovens, waffle irons, fire place grates, &c.

New Milk Can Breast.

Sidney Shepard & Co., Buffalo, N. Y., have brought out a new milk can breast, the special features of which are shown in the accompanying cut, which presents a general view of the can and also a section through the joint. The feature, as will be seen by examining the sectional view, is that the breast is located between the sec-



New Milk Can Breast.

tions of the hoop in such a way that it is practically impossible to displace it without tearing the can to pieces. After being securely fastened the whole is retinned. The breast, as shown, is firmly gripped between the shoulder A and the top of hoop, which is turned inward at B, and it is also supported by the hoop C. The manufacturers advise us that they will send sample pieces of the breast to any interested dealer to show clearly the method of construction, which they consider pre-eminent for strength and durability.

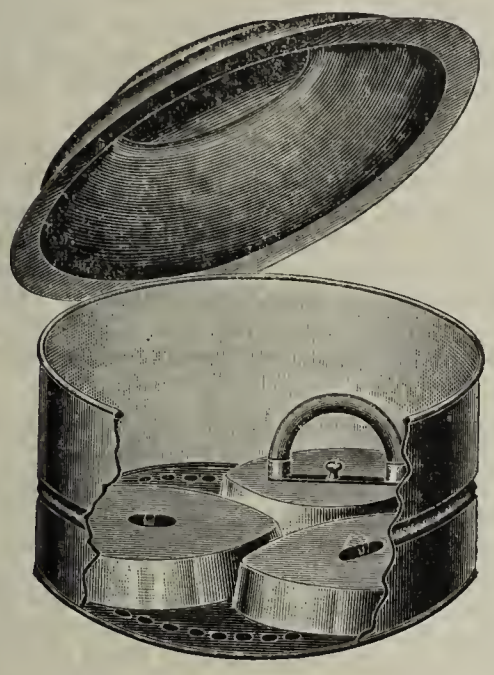
Spray Pumps.

We are indebted to the Berger Mfg. Company, Canton, Ohio, for an interesting and seasonable pamphlet entitled "The Result of Spraying." The whole tendency of modern farming and gardening is toward greater care in cultivation as distinguished from the old time way of careless methods and large areas. Directly in this line can the results of the labors of entomologists be employed, who have given practical directions for destroying insects on trees and plants, and the common method of destruction is by using a chemical mixture applied by spray pumps. Recognizing the demand for pumps of this kind the Berger Mfg. Company make a number of different styles of spray pumps and issue the catalogue referred to giving illustrations of various styles of pumps and directions for their use, together with valuable information upon the mixtures for spraying and the manner of application. The pumps shown in the catalogue are the Novelty force and spray pump, the Monarch spray pump, the Fountain spray pump, the Advance bucket or barrel

spray pump and the Wizard brass bucket spray pumps. Other applications of these pumps for cleaning windows, extinguishing fires, washing carriages, &c, are illustrated in the catalogue, which is neatly printed and embellished with pretty designs in light blue in addition to the regular illustrations.

Champion Sad Iron Heater.

We show in the accompanying illustration a broken view of the Champion sad iron heater, made by the Champion Novelty Company, Cleveland, Ohio, the purpose of the device being to heat sad irons on gas, gasoline or coal oil stoves. The heater is made of steel lined with asbestos so as to prevent the escape of heat, the flat irons

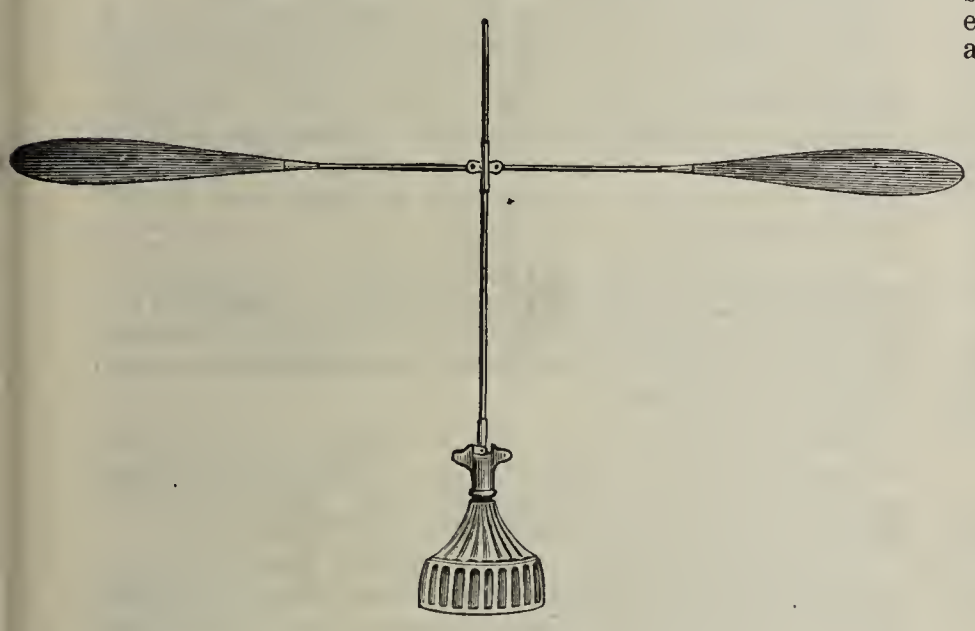


Champion Sad Iron Heater.

being placed in the bottom and are thus warmed from all sides, the result being, it is claimed, that they will retain their heat a much longer time than if they are merely heated on the bottom in the old way. The cover of the heater is fastened with a hinge with an iron projecting over it, and by pressing on it a little with a sad iron the cover will open without touching it with the hand. When through ironing the sad irons can be left in the heater and the whole stored away. It is especially pointed out that by the use of this device the irons are kept perfectly clean from soot and grease.

The Fowler Improved Fly Fan.

The accompanying illustration shows the improved keyless fly fan which Matthai, Ingram & Co., Baltimore, Md., are offering to the trade. The improvement is mainly in the base, which, besides being less cumbersome and of better shape than the old pattern, is shorter and



The Fowler Improved Fly Fan.

allows of the wings being brought close to the table when required. The wing holder is adjustable, allowing the wings to revolve at any angle required. An automatic stop catch prevents unwinding of the spring when the wings are removed. The winding attachment is simple and easily operated, and being operated without a key is a decided convenience. The makers state that the price of the improved article is sufficiently low to insure for it a good sale.

Buzzacott's Portable Cooking Equipment.

Illustrations are herewith given of a new portable cooking equipment designed by the well-known Buzzacott and manufactured by Henry Giessel & Co., 43 and 45 Franklin street, Chicago. This equipment is intended for use by miners and others who live in camps and are obliged to pack much in little space, yet desire as many of the comforts and even luxuries of life as conditions will



Fig. 1.—Buzzacott's Portable Cooking Equipment.

permit. Fig. 1 shows the outfit packed, everything being inside the stove. This outfit is 18 inches square over all, weighs but 50 pounds, and has a cooking capacity for 6 to 12 persons. It consists of 18 complete parts—namely, one portable steel cook stove and heater, with a four-hole top and lids and double shelf doors; one double shelved extra size removable steel oven; one telescopic pipe, 8 feet, with damper and spark arrester; one 3-quart miners' solid lip coffee pot, with bail and cover; one 4-quart stamped steel

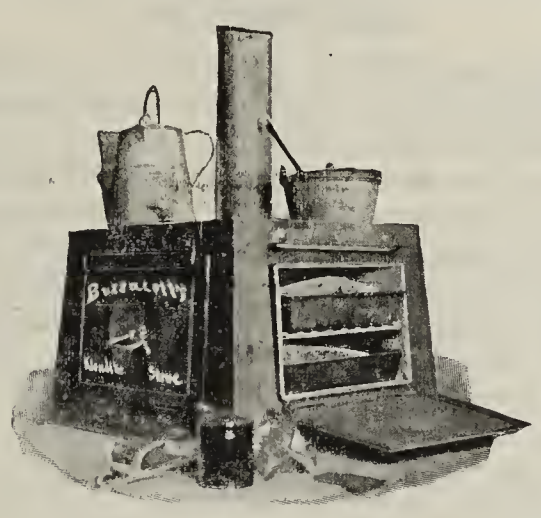


Fig. 2 —Cooking Equipment in Use.

stew pot and kettle, retinned, with bail and cover; one shelf and grating, to be used in oven when desired; two combination roasting, baking and frying pans; one each cook's spoon, fork, turn over, ladle and ladle strainer, all with solid handles, retinned and extra heavy and strong; salt, pepper and flour dredges and two lifters to handle everything when in use. All the utensils are specially adapted for camp use, everything being doubly riveted

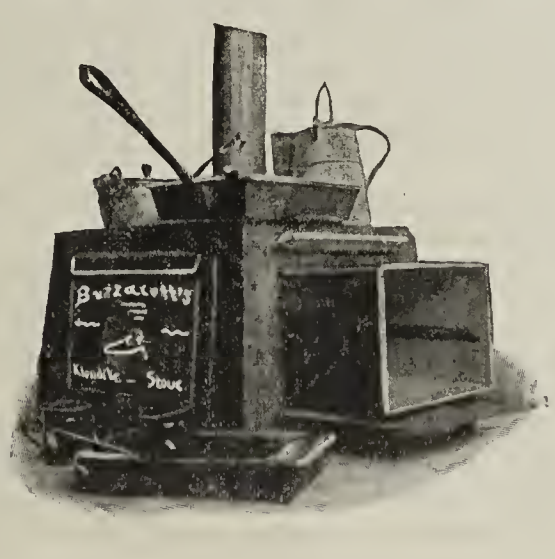


Fig. 3.—Cooker Converted Into a Heater.

no solder being used on spouts or other parts to melt off. Fig. 2 shows the stove in use, with two pans in the oven. Fig. 3 shows how the oven can be removed, instantly converting the cook stove into a heater of great capacity, which will accommodate a chunk of wood large enough to keep fire all night.

M. S. Mench of Wilkinsburg, Pa., has removed to Chattanooga, Tenn., and will on April 1 open up a Tinware store at 820 Market street.

Fire at Keen & Hagerty's Factory.

The large factory of Keen & Hagerty, manufacturers of tin, japanned and galvanized ware, at Ostend, Race, Clement and Creek streets, Baltimore, Md., was seriously damaged by a fire which broke out on the third floor of the building on Saturday last. The two upper floors, to which the fire was almost entirely confined, were gutted, and a considerable amount of stock and valuable machinery was destroyed. The total loss incurred is placed at between $150,000 and $200,000, which is understood to be covered by insurance. The factory is a large and substantial brick structure of four stories and basement, built about three years ago at a cost of over $100,000. The top floor was occupied by the japanning, soldering and paint departments, and the third floor, on which the fire broke out, by the spinning and light pieced ware departments. Both of these contained a large amount of stock, all of which was lost.

The lower floors, where the heavy stamping machinery is located, were not much injured, except by water, and it is expected that that part of the factory will be again in running order by April 1. Meanwhile the rebuilding of the burned out portion of the factory will be rapidly proceeded with. The roof is already nearly in place. The galvanizing and tinning department, which is located in an adjoining building, was uninjured, as is the large new enameled ware factory, which is in course of erection alongside the tinware factory. The stamped goods department was practically unaffected, and deliveries in orders for stamped ware will be made right along. Keen & Hagerty have issued a circular to their customers saying that all orders in hand will be taken care of, and they expect to be ready to take new orders after April 1.

MEMORANDA.

Manufacturers of Hot Air Registers are much encouraged by the volume of inquiry for these goods and look for a favorable year in their business. A tendency is noted toward the use of the better grades of goods in new buildings. Architects are paying considerable attention to the artistic qualities of the Registers put into the buildings now in course of construction, particularly those of a public character. A number of new and handsome designs will be a feature of this year's trade. The higher range of prices initiated on January 1 is being well maintained by all the makers.

Rich, Munk & Co., located at 180 South Hugh street, Columbus, Ohio, have just started in the Stove and Furnace business and intend to carry a large line of Stoves, Furnaces and Kitchen Utensils. The firm are composed of Hiram M. Munk and George Rich, who were formerly connected with the firm of Bradley, Munk & Co.

The Aluminum Mfg. Company, Two Rivers, Wis., have issued a catalogue of Aluminum Novelties, comprising Gear Cases, Bicycle Guards, Advertising Devices, Trays, Razor Handles, Key Chains, Match Safes, Name Plates, House Numbers, Combs, Hair Pins, &c.

E. Lehr & Co. are a new firm composed of Edward Lehr, Mrs. Minnie Weigand and Mark Lesser, who will open a general House Furnishing business April 1 at 1900 Third avenue, on the southwest corner of 105th street, New York City. Mr. Lehr and Mrs. Weigand have been for many years in the employ of Rieser & Co., 473 Broadway. Mr. Lesser is an old furniture man, having been for many years with Baumann Brothers.

Thompson & Southerland have opened a new Hardware and Stove store at Westville, N. Y.

The Hammel Oil Burner Company of Los Angeles, Cal., have been incorporated, with a capital stock of $50,000. The directors are W. C. Patterson, Chas. A. Hammel, Levi Booth, J. A. Kenworthy and Thos. Haverty, all of Los Angeles.

The Standard Stamping Company are about to put up an important addition to their plant at Broadway and Chambers street, St. Louis, Mo.

Frank Bowman has opened a new tin shop at Rothville, Pa.

The Gille Hardware & Iron Company, Kansas City, Mo., one of the largest jobbing houses in that city, have leased a factory 50 x 100 feet, with four stories and basement, on St. Louis Avenue and Santa Fe street, where they will manufacture an extensive line of Tinware and Sheet Metal and Galvanized goods.

William Walker has purchased the Hardware, Stove and Tinware business of John C. Stanley, at Newburyport, Mass., and will occupy the premises in the Stanley Building, 15 and 17 Water street.

The Burbanks Hardware Company, Cohoes, N. Y., have been incorporated, with a capital of $8000 and the following officers: Paul H. Andrae, president; C. E. Pearce, vice-president; A. G. Burbanks, secretary and treasurer. The company are retailers of Shelf Hardware, Stoves and Tinware, Bicycles, Paints and Oils, &c., a plumbing and tin roofing department being also conducted. Business is done principally on a cash basis, limited time being granted in the sale of Stoves.

S. R. Miles and H. E. Runyon, under the style of Miles & Runyon, are successors to John Lee in the Hardware and Stove business, 205 South Main street, Mason City, Iowa. The new firm advise us that they have remodeled the entire interior of their store, largely increasing the shelf room, thus enabling them to carry a much more complete stock than was carried by their predecessor. They are also adding an indexed catalogue case to their equipment, and are desirous of receiving catalogues and other printed matter from manufacturers in their line.

Arthur Lee of Lapeer, Mich., has purchased an interest in the Hardware business of his brother, H. J. Lee, Milford, Mich., and the firm will hereafter be known as H. J. Lee & Bro. It is intended to remodel the establishment throughout with a view to bringing it down to date. The stock comprises Shelf Hardware, Stoves, Tinware, Agricultural Implements, Bicycles, &c. The firm advise us that they would be pleased to receive catalogues and circulars from the trade.

The Brown & Dowd Mfg. Company, Meriden, Conn., issue their 1898 catalogue, showing Can Openers, Tack Pullers and Claws, Potato Masher and Beater, Cleaver, Mincing Knives, Meat Tenderers, Egg Beaeetr and Cream Whip, Kettle Scraper, Fish and Griddle Cake Turners, Ice Picks, Coal and Oyster Tongs, Towel Rack, Clothes Line Pulleys, Tack Hammer, Scrapers, Nut Crackers and Picks, Screw Drivers, Glass Cutters, &c. They call special attention to their Never Slip Can Opener and King Can Opener with Corkscrew.

The Simmons Hardware Company, St. Louis, have added to their already extensive line a full and complete assortment of Ready Mixed Paints, which will be offered to the trade under the name of "Deerfoot."

A. H. Totman, Fairfield, Maine, has purchased the stock of Hardware, Paints and Oils, Farm Implements, Stoves, &c., of S. H. Blackwell, his only competitor.

Taber, Carey & Reid, Augusta, Maine, have recently enlarged their stock by the addition of a complete line of Carpenters' Tools and Builders' Hardware. They are also dealers in Stoves and Plumbing Supplies.

H. L. McNamara will open a new store in the Armory Block, Janesville, Wis., about April 1. Mr. McNamara, who traveled on the road for 18 years for L. Gould & Co. of Chicago, will handle a varied line including Builders' Hardware, House Furnishing Goods, Wooden Ware, &c.

Potter & Nattress Hardware Company are successors to Marshall, Potter & Son in the Hardware and Stove business in Storm Lake, Iowa. The company are also manufacturers of Copper, Sheet Iron and Tinware.

J. F. Bigelow, 19 Foster street, Worcester, Mass., is offering the Bigelow wire fly killer for the season of 1898. This device is in the form of a small wire broom, and it kills but does not crush the fly or other insect. The manufacturer states that the insects can be killed on the most delicate wall or ceiling without soiling. The wire fly killers are put up in attractive packages, and display stands are furnished to set on show cases or in windows; also, as an additional advertising feature, the manufacturer furnishes display forms to hang up. These come in several different styles, and each makes an attractive display. The length of the fly killer is 16 inches, and they are packed in boxes of one dozen and shipped in one, two and three gross cases.

William Geuder, president and founder of the Geuder & Paeschke Mfg. Company, manufacturers of tinware and stamped goods, Milwaukee, Wis., has received the Republican nomination for Mayor of that city.

Lalance and Grosjean Mfg. Company, New York City, have gotten out a handsome advertising sheet for the benefit of the retail trade, giving illustrations of their Pearl-Agate Ware in its natural colors. The assortment of colors consists of violet, chocolate, salmon, russet and sage, with which the articles are enameled on the outside in bright mottled colors. The inside coating is a fine white porcelain.

Bell & Anderson, Portland, Conn., have sent us a catalogue of their Anderson Lead Pipe Coupling, a device by which any mechanic can connect lead pipe so that the joint will stand any pressure. A number of new applications of the Coupling are shown for waste and vent as well as service pipes.

TIN PLATES.

The Welsh Tin Plate Failure.

Much sympathy is expressed for E. Morewood & Co. of Llanelly, South Wales, in their present difficulties. The firm were one of the oldest and most influential tin plate manufacturing concerns in Wales, and the founder, the late Edmund Morewood, was always prominently connected with the development of the Welsh industry. The firm were founded in the early sixties, and down to May, 1897, they were a private company, trading under the name of E. Morewood & Co. They were then converted into a limited corporation, with a capital of $833,700. The South Wales works of the firm, at Llanelly, comprise four large steel furnaces and 15 tin plate mills, with tinning and galvanizing plant, over 1200 hands being employed. At their Cwmbwrla plant there are two steel furnaces and eight mills, and at these works some 700 are ordinarily employed.

The suspension of the firm is attributed, in a circular letter sent to the creditors by J. H. Rogers, the managing director, to "the depression in the tin plate industry, the loss consequent upon the recent strike among the company's workmen at Cwmbwrla and labor difficulties in Llanelly, and the lockups of capital in plant and stock in connection with the sheet and galvanizing industry which we recently instituted." The belief is expressed in the same circular that the assets of the company, which are very large, if judiciously realized, will be more than sufficient to provide payment in full of all the company's obligations and leave a surplus for the shareholders.

At a meeting of the shareholders, held at Llanelly, it was unanimously decided to wind up the company and T. B. Peat of London was appointed liquidator. The share holders expressed the desire, however, to continue operations at the works, and every effort is to be made to carry this out and to run the works for the benefit of all concerned. A reduction of 15 per cent. in wages was called for and it is understood was agreed to by the workmen.

The plant of the Morewood Company, at Gas City, Ind., is in no way affected by the Llanelly failure. The two concerns are entirely separate and distinct. The Gas City plant is reported to be in an exceptionally flourishing condition.

The Canning Industry of California.

Referring to an article on the "Canning Industry," in *The Metal Worker* of February 19, a correspondent at San Jose, Cal., who signs himself "Can Maker," complains that it ignores the Pacific Coast. "Our canning industry," he says, "is larger than our Klondike boom. Even in this little city we have five canneries for fruit and two for oysters, with capital invested to the amount of $5,000,000, employing 4000 people in the season. Other fruit towns are equal to this, and most of the salmon catch of Alaska is salted and shipped to San Francisco for canning. Give us a jolt once in a while." We willingly make the *amende honorable* to the Pacific Coast canning industry, special mention of which was omitted in the article in question from lack of reliable data.

SCRAP.

While the volume of business in Tin Plates shows no material enlargement here, the feeling in the trade exhibits some signs of improvement, and the probability of higher prices is more commonly referred to . The situation seems to be considerably more favorable in the West than in the East.

Work on the consolidation project appears to be suspended for the moment, although, by all accounts, the scheme is still a live possibility. The members of the committee having it in charge are scattered at the present time. Two of the four are in the South for rest and recreation and one is in the East undergoing medical treatment.

Mackintosh, Hemphill & Co., Pittsburgh, Pa., are busy in the construction of 30 hot mills and 27 cold mills for the Shenango Tin Plate Company, New Castle, Pa., the largest single order for Tin Plate machinery ever placed.

Richard R. Quay of the Monongahela Tin Plate Company, Pittsburgh, Pa., who is one of the special committee charged with the task of arranging a plan for the consolidation of the Tin Plate industry, has gone to Florida for a month's vacation.

The depressed condition of the Welsh Tin Plate industry, which has led to the financial embarrassment of E. Morewood & Co. of Llanelly, the largest manufacturers of Tin Plate in Wales, is further emphasized in the latest reports from the other side, which indicate that over 20 Tin Plate mills at Morriston, Llanelly and Llangennech had suspended operations. This will have a material effect on production, taking nearly 15,000 boxes a week out of the market. It is thought that the restricted production may lead to a hardening of Tin Plate prices on the other side.

Several Welsh Tin Plate concerns are turning their attention to other products. The Cwmfelin mills are devoting their efforts to the manufacture of Black Plate for special purposes and the Foxhole works are being adapted to the rolling of galvanized sheets.

The entire nine-mill Tin Plate plant of the La Belle Iron Works, Wheeling, W. Va., is reported to be in active operation. The six new mills give a trebled capacity to the works, enabling them to fill all orders promptly. One of the new mills is equipped with 36-inch rolls, while the others are of 26-inch measurement.

The British Board of Trade returns for the month of February, 1898, show that 8924 tons of Tin Plate were exported from Great Britain to the United States last month, as against 8883 tons in January last and 9678 tons in February, 1897.

That some of the leading Welsh Tin Plate makers do not take a sanguine view of the situation is evidenced by the fact that the men at the Old Castle, the Old Lodge and the Western Tin Plate Works, at Llanelly, have been informed by the managers that unless they are willing to submit to a continuance of the reduction of 15 per cent. in wages until the end of June those works will be closed.

The Rock Island (Ill.) *Union* says that two representatives of a large Eastern Tin Plate concern recently visited that city, with the view of establishing a branch Tin Plate works there. Negotiations were opened up with the representatives of local interests and the outlook is regarded as favorable for the erection of the plant in Rock Island County. Cheap fuel and excellent transportation facilities are among the recommendations of the locality for the establishment of the industry.

The Monongahela Tin Plate Company of Pittsburgh, Pa., have opened an Eastern office at the Market and Fulton Bank Building, Fulton street, New York City, under the charge of J. Wildberg.

The Leechburg Foundry & Machine Company of Pittsburgh have received an order from the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., for three stands of hot mills, 24 x 32 inches, and two stands of hot rolls, 30 x 30 inches. Also six 36 inch doubling shears with electric motor attached to each, and three 36-inch squaring shears of their heavy design. The Leechburg Foundry & Machine company have more work on hand at the present time than ever before in their history, and are operating their large shops full time in all departments. They are also adding to their equipment a number of new machine tools which will considerably enlarge their capacity for turning out work.

The Boston office of the Nashua Iron & Brass Foundry Company of Nashua, N. H., has been removed to 85 and 87 Pearl street and is in charge of Homer F. Livermore, selling agent. The above concern succeeded the Nashua Lock Company, and have a well equipped plant for the production of Iron, Brass and Aluminum Castings.

The Senate Committee on Public Buildings and Grounds has made a favorable report on the following amendments to the sundry civil appropriation bill : Extending the limit of the cost of the public building at St. Paul, Minn., to $250,000 ; extending the limit of the cost of the building at Stockton, Cal., to $156,000, and appropriating $50,000 for the purchase of a site for a public building at Butte, Mont.

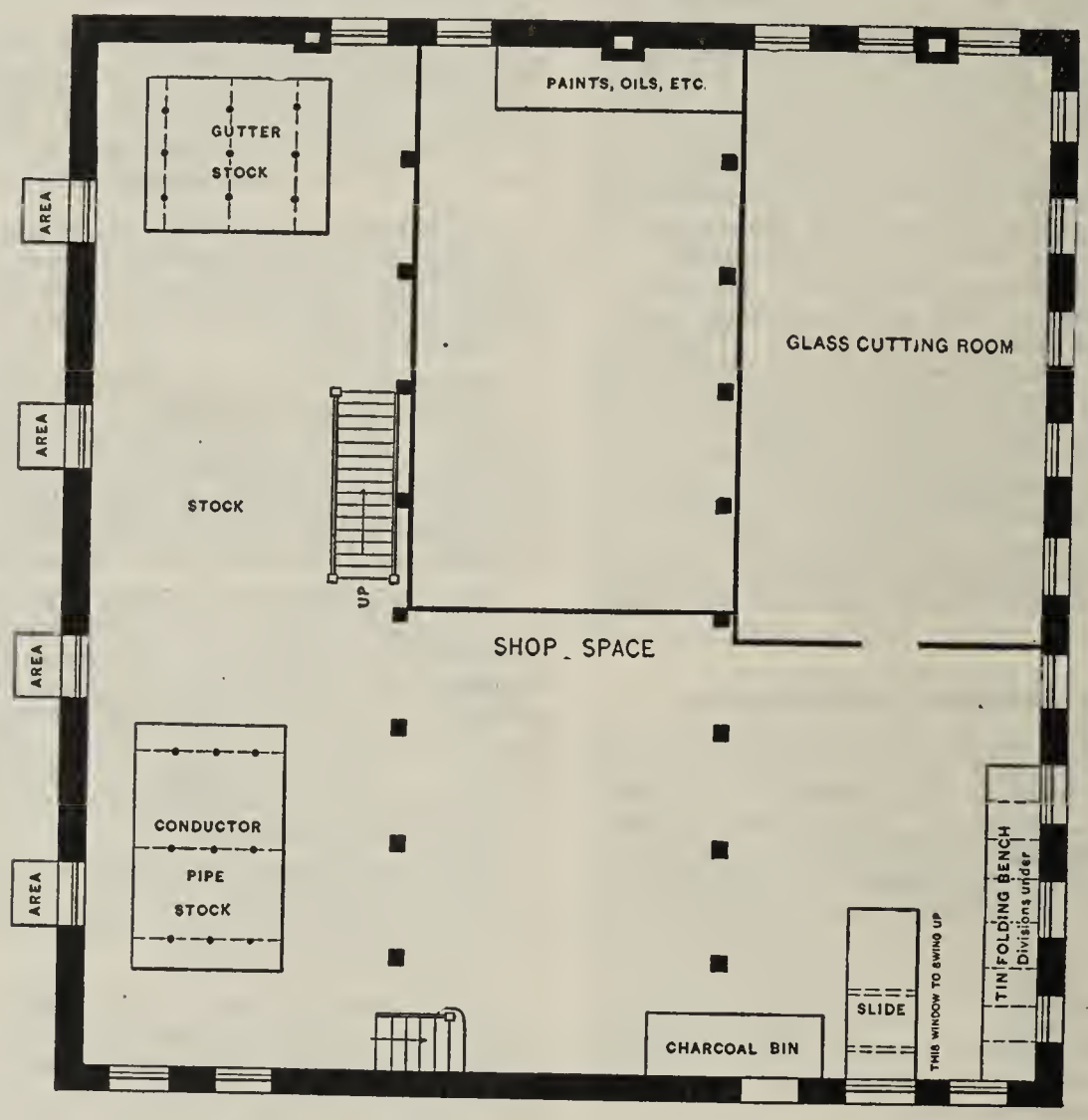
SHEET METAL WORK.

SHEET METAL WORKERS' SHOP.

An example of a well arranged and complete shop for the manufacture of sheet metal work for buildings in all its branches is the one erected for C. G. Brunnckow, Providence, R. I., the arrangement of which is shown by the floor plans presented herewith. Mr. Brunnckow was a partner in the firm of Leo J. Schletger & Co., at 50 Point street, Providence, who began business in 1888, and he assumed entire control of the business in 1894. The growth of his trade made it necessary to secure larger quarters, and he therefore decided to erect a building entirely devoted to sheet metal architectural work.

The shop is located in the manufacturing district of Providence, at 227-229 Globe street, and is easily reached by three different lines of electric railroads. Mr. Brunnckow took possession of his new quarters May 15, 1897, and is now in position to carry a force of from 75 to 125 men should the state of business warrant it. The building covers an area 75 x 72 feet, and gives three working floors, the basement, first and second floors. A plan of the basement floor is shown in Fig. 1. As the divisions on the plan indicate, a large part of the basement is given up to stock. The basement is well lighted by area windows along the left side, while the slope of the ground gives a full window depth on the opposite side and good light also at the front and rear. The hight of the basement is 8 feet and the upper floor is supported by a double row of hard pine posts 10 inches square. Just at the right of the entrance is the bin for storing charcoal, while near it, alongside the right wall, is a tin folding bench, and the adjacent corner is given up to a glass cutting room, as marked on the plan, while near it, at the back, are stored the paints and oils. The entire left side of the basement is given up to stock, conductor pipe, gutters, &c.

The second floor, a plan of which is shown in Fig. 2, is 11 feet high, and here the main work is done. It will be noticed that there are ample window space and large doors at front and rear for the removal of completed work and the entrance of stock. The main office, a room 22 x 14 feet, is at the left of the entrance, and toilet rooms both for the office and for the shop are at the rear, while beyond is the foreman's room and in the corner is the gilding room, secluded from the shop to prevent the entrance of dust. Along the back and remaining sides of the shop are benches and in the middle space is a full assortment of sheet metal working tools and other machinery, including gutter beaders, brakes, shears, crimpers, hammering machine for circular moldings, punches, lathes, anvil and forge, &c., a large open space in the middle of the room being reserved for two benches, one of which is 23 x 3 feet and the other 22 x 3 feet. The whole shop is open, the only obstruction being the double row of 8 x 8 hard pine posts.



Sheet Metal Workers' Shop —Fig. 1.—Basement Floor Plan.

The upper floor, a plan of which is presented in Fig. 3, is where the work is set up. Benches are provided on more than half of the wall space and there are two large benches in the middle and a smaller one at the left, the only machinery being an 8-foot brake. Closets and toilet rooms for the men are provided in this room, and wide sash doors open at either end, with outriggers for handling the completed work. This upper floor is further lighted by a large skylight, measuring 17 x 10 feet, placed over the center. In keeping with modern methods, the power for this shop is electrical, the motor to drive the machine tools being located in the middle of the second floor, as shown on Fig. 2.

As an indication of the class of work done by Mr. Brunnckow the following are a few of the contracts completed during the past three years, and which include all the sheet metal work necessary on the buildings: Baltic Power Company's mills of Baltic, Conn.; Rhode Island School of Design, West Side High School, St. Vincent de dormitory and gymnasium, St. Francis Xavier's Convent, Home for Aged Men, State Normal School, Anthony & Cowell Company's building, all of Providence, R. I.; St. Mary's Convent, Pawtucket; Pawtucket High School, Bristol High School, depots for the N. Y., N. H. & H. R. R. at Brockton and Campbell's, Mass.; Columbia Paul Asylum, addition to Providence Public Library, Hotel Norman, Lederer Building, Columbia Building (Col. A. Pope), Metcalfe Building, Brown University Building, Boston; R. C. church, Lowell; Gould Paper Mills, Lyons' Falls, N. Y.; Art Museum of Worcester, Mass., &c.

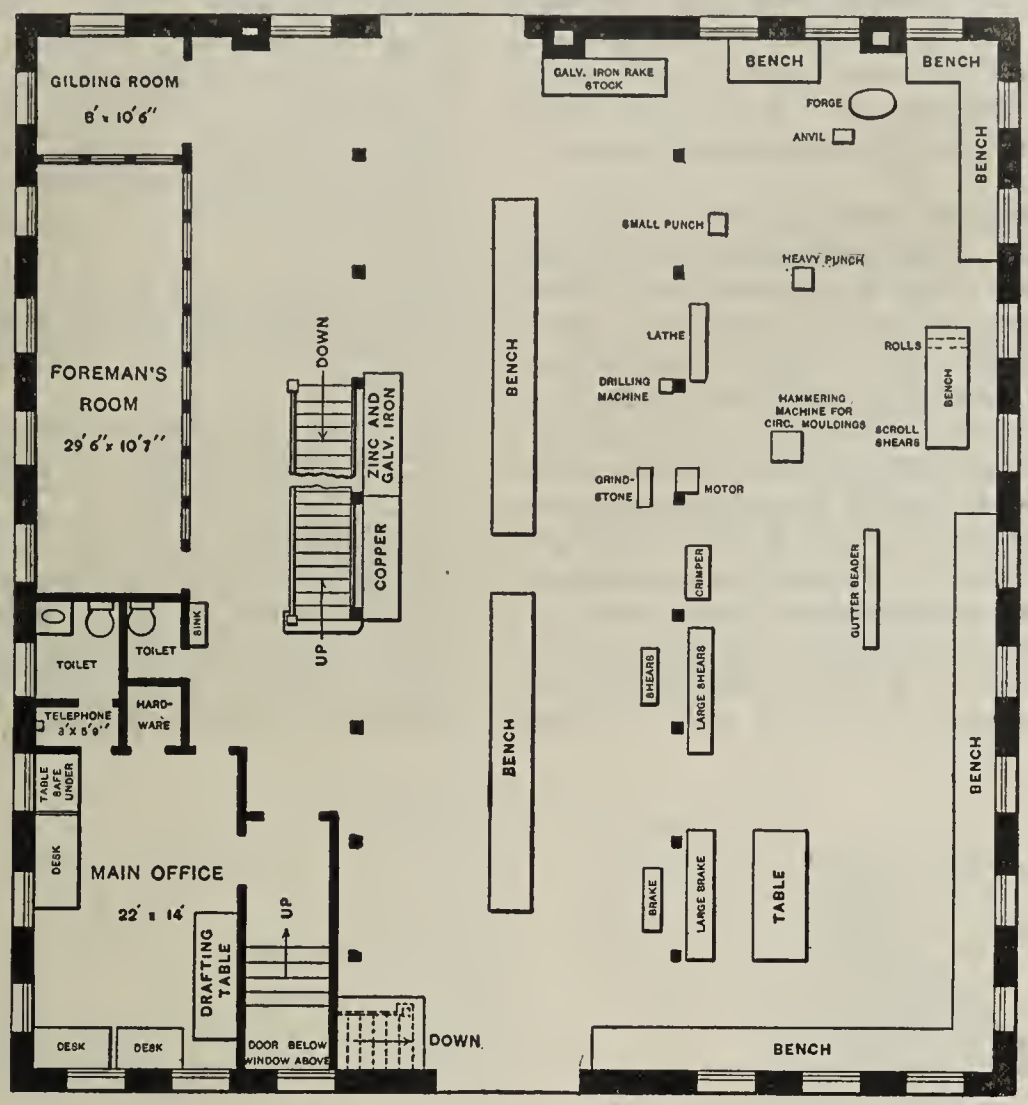


Fig. 2.—First-Floor Plan.

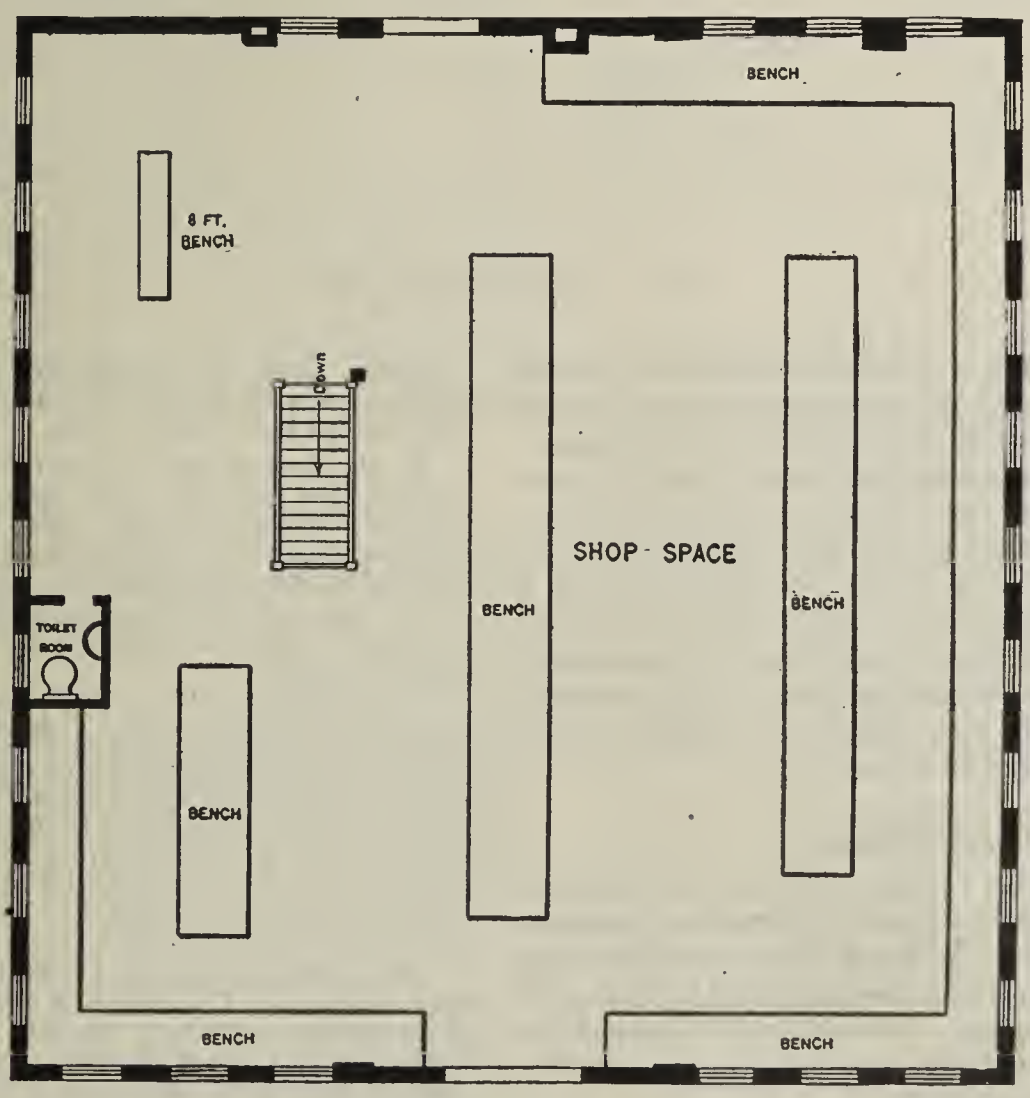


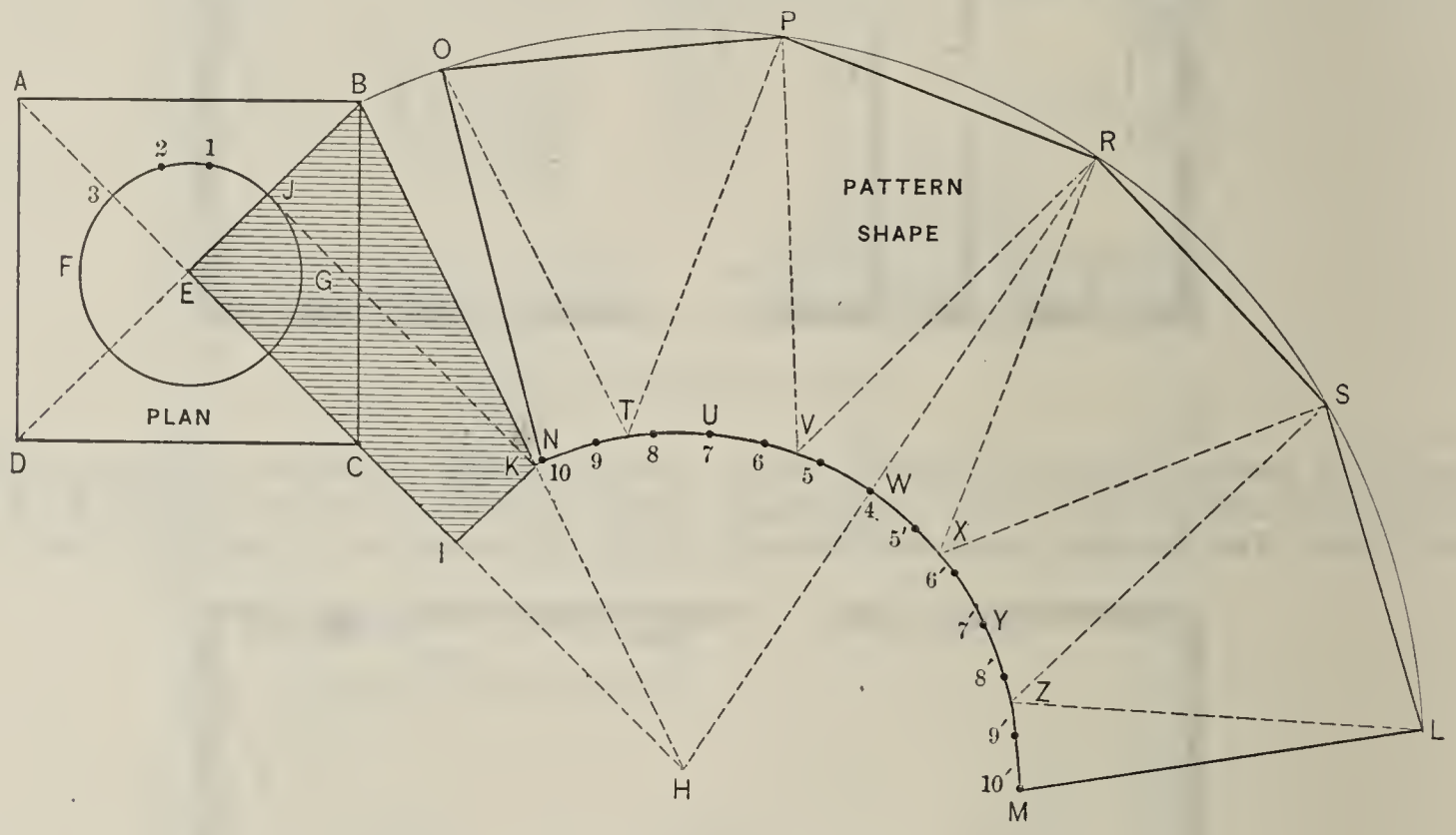
Fig. 3.—Second-Floor Plan.

SHORT RULE FOR CHIMNEY BASE.

BY W. N.

When a ventilator is placed over a chimney flue and a chimney base is required, it would involve too much time and labor to lay it out by the cone or triangulation method, and would not pay when there are a number of flues, each being of different size. A short rule can be employed, and while not strictly accurate will answer all practical purposes.

Let A B C D in the accompanying sketch be the size of the base at the bottom. Draw the diagonal lines A C and B D, intersecting at E. With E as center, and with the required radius, describe the circle F G, which represents the size of the pipe at the top. Now at right angles to B E draw the lines E I and J K equal to the hight of the article; connect the points I K and K B. Then will B E I K represent a section standing perpendicular on the line B E. Extend the lines E I and B K until they intersect at H. Now with H as center, and H K and H B as radii, describe the arcs N M and O L. Let the dividers equal A B or A D; and, commencing at O, step off four spaces, as P, R, S, L. Connect with lines as shown from O to L. From the center of the spaces, as R, draw a line to the center point H. Divide the quarter circle in plan into equal spaces, as shown by J, 1, 2, 3, which divide the quarter circle into three spaces or the full circle into 12. Set off six spaces on the arc N M, commencing at the intersection W, either way, as shown from 4 to 10 and from 4 to 10′. Draw a line from O to 10 and from L to 10′. Now, divide the arc shown from M to N into eight equal spaces, as shown by T, U, V, W, X, Y, Z. Connect L to Z and Z to S; skip Y and connect S to X and X to R; skip W and connect R to V, &c., until all points have been connected. Then will O L M N be the pattern shape. When forming bend slightly on dotted lines, making the top round, while the bends O, P, R, S, L die out at the top.



Short Rule for Chimney Base.

FLASHINGS.

The strength of raw Copper has been accompanied by a sharp advance in the price of all kinds of manufactured Copper and Brass. As noted in our trade columns the price of Sheet Copper has been advanced by the makers about 1 cent a pound. A considerable demand for Cornice Copper is noted and the outlook in the department is regarded very favorably.

Peden & Co., Houston, Texas, jobbers in Tin Plate and Roofing Materials, report having sent out 500 carloads of freight during 1897, which was an advance on their business of previous years. The present year, moreover, promises to greatly exceed this, as during January and February their shipments amounted approximately to 200 carloads. The territory covered by the house is Texas, Southern Louisiana, Indian and Oklahoma Territories and part of old Mexico. The company with characteristic enterprise have recently sent out a novel form of advertising circular, being a map of the Yukon district, showing the various routes to the Klondike. The bearing of this advertising circular on the business of Peden & Co., as stated, is that gold will be both saved and made by patronizing a Texas house for Roofing Materials, Tinners' Supplies, &c., and also that a person coming to Texas and calling at 1013 Franklin avenue, Houston, will not find a cold reception. Incidentally reference is made to the extensive line of Roofing Materials handled by this concern.

S. E. Dibble, New Haven, Conn., has taken the contract for roofing the Candee Rubber Company's packing room and storage house, amounting to 25,000 square feet of surface.

The Lewis Roofing Company of Rock Island, Ill., have been incorporated, with a capital stock of $25,000, by Frank J. Lewis, Edward W. Lewis and Henry A. Koenig.

W. J. Burton & Co., Detroit, Mich., send out advertising cards stating that owing to low prices they increased their sales in February 159⅓ per cent. over the corresponding month of 1897. They add that they will endeavor to repeat it each month by making bottom prices and quick shipments of all kinds of Metallic Roofing and Siding, Eastlake Shingles, Gutter and Conductor Pipe, Galvanized Iron and Tin Plate, Cornices, Skylights, &c. The firm have just completed the contract for copper work and tile roofing on the new depot for the Wabash Railroad, at Montpelier, Ohio.

R. H. Herron & Co., who have purchased the Los Angeles Iron & Steel Works, Los Angeles, Cal., will, it is reported, shortly put the plant in operation again. In addition to the sheet mills the plant has equipment for corrugating and galvanizing.

The Reeves Iron Company, Canal Dover, Ohio, will, it is reported, add three more sheet mills to their already extensive plant.

C. G. Hussey & Co. of the Pittsburgh Copper & Brass Rolling Mills, Second avenue, Pittsburgh, Pa., direct attention of the trade to Brass and Copper, which they are prepared to furnish in many different forms. Announcement is made that they can furnish Copper rolled to all thicknesses and cut to all sizes and shapes, Brass in sheets, rolls, bars and wire. This is one of the oldest concerns in Pittsburgh, having been engaged in the Brass and Copper trade in that city for many years.

The different expanded metal companies held a two days' meeting in Philadelphia this week for the purpose of discussing matters of interest to the expanded metal trade in general. On Monday evening many of the principal architects and engineers of Philadelphia, by invitation of James S. Merritt of Merritt & Co., Philadelphia, attended an evening session of the meeting at the Engineers' Club. Walter Hill of New York delivered a lengthy address on "Steel in Combination with Concrete," illustrating his points with blackboard drawings. The address was followed by a lengthy discussion in which a majority of those present participated.

STOVE TRADE NOTES.

A Notable Hotel Contract.

The Brand Stove Company of Milwaukee, Wis., have just competed and installed a line of cooking apparatus for the remodeled Sherman House, Chicago, which is worthy of description. In the main kitchen they have placed a hard coal wrought steel and nickel trimmed 20-foot range, having five square fire boxes and five ovens, each of the latter 24 x 25½ x 16 inches, with drop doors. Above the range is a double shelf. In the kitchen are also placed one 36 and one 30 inch charcoal broiler; one steam heated plate warmer 10 feet long, 2 feet wide and 5 feet high, of galvanized iron, having four perforated shelves; one 30-gallon and one 60-gallon copper jacket steam heated kettle for general cooking purposes and two steam heated galvanized egg boilers. The serving room is fitted with one steam heated 16-foot copper carving table, having six meat dishes, two soup tureens, five gravy bowls and eight vegetable pots, with a galvanized iron plate warmer beneath containing two perforated shelves: also a steam heated galvanized iron plate warmer, 12 feet long, 2 feet deep and 5 feet high, with four perforated shelves: battery of four oyster and two milk bowls, set on a copper covered wooden board and steam connected: one set battery of steam heated nickel plated copper urns, comprising one 12-gallon hot water, two 10-gallon coffee and one 5-gallon tea: galvanized iron cup warmer, with three perforated shelves: one 6-foot gas range, containing two roasting ovens and a broiling oven; one triple bar saucepan rack, 12 feet long: an 18-foot cook's steam heated table, oak top, with copper bain marie pan, 60 x 30 inches; a cast polished hot plate, 48 x 36 inches by ¾ inch thick, resting on a steam coil, and a gas cake griddle, 36 x 24 inches.

The lunch room contains four 20-gallon combination coolers for water, cream and milk, made of heavy planished copper; two batteries of urns, each set consisting of 12-gallon hot water, two 10-gallon coffee and two 5-gallon tea urns, all nickel plated and steam heated; two Russia iron roll warmers, 3 feet long, 2 feet deep and 2 feet high, with two perforated wooden shelves, double swing doors and trimmed with brass hinges and springs; one gas cake griddle, 36 x 24 inches, and one steam heated galvanized iron egg boiler with six wire egg baskets. The sales counter has a nickel plated steam heated 10-gallon coffee urn and 6 gallon tea urn.

The order for these was taken February 1 by F. M. Whitson, representing the company in this line, at 183 Lake street, Chicago, who has been in the business of furnishing hotel implements for culinary purposes for 14 years, and has been connected with this company since January 1. In the short time elapsed since taking the order these goods were made according to specifications given. This is the line of work which the Brand Stove Company purchased from Seavey Brothers of Chicago some time since and are developing with marked success. They have furnished quite a number of important hotel outfits.

Peck-Williamson Laundry Drier.

The Peck-Williamson Heating & Ventilating Company, Cincinnati, have issued a most attractive catalogue illustrating and describing their new laundry drier. The apparatus brought out by this company is a combination laundry stove, water boiler, clothes drier and iron heater, operated by one fire. The laundry stove used with this drier has two 8-inch holes on top, which may be used with any ordinary cooking utensils for cooking purposes. Much of the heat from the fuel is thus utilized which would be ordinarily wasted. These driers are made of any size, from the smallest, for use in a residence or in the kitchen of a residence, to the largest size, for public laundries, hotels, hospitals or any public or private institution. Four or five standard sizes are commonly used in private residences, but the length, width, hight, number of racks, &c., may be varied to suit any required needs. These driers can be adapted to use coal, wood, gas, steam or hot water for heating. They are constructed throughout, front, back, both sides and top, of galvanized sheet steel. The racks on which clothes are hung are made of galvanized iron gas pipes, neatly put together, and slide in and out on a frame of wrought iron bars. The interior is so made that it will not stain, rust or become foul. A man hole door is placed on the side, so that every part of the apparatus is easily accessible. A wire grill of inch mesh separates the drier part from the heating drums underneath, so that clothes which by accident fall off the racks cannot fall on or be injured by the hot surfaces. Every care has been taken to utilize as thoroughly as possible the heat from smoke and other products of combustion, so as to make the apparatus economical in its operation. Everything about the drier is fire proof and rust proof. Care is also taken to secure thorough ventilation during the process of drying clothes, by which it is claimed that they are bleached as well as thoroughly and completely dried. A drier with four racks, it is claimed, can dry the washing of four ordinary families in one day, as each hanging is thoroughly dried in 15 to 20 minutes. Attachments of the same character are made on a smaller scale, to be attached to kitchen ranges, to enable small articles to be daily dried without requiring any extra heat. Illustrations are given of handsome residences in which the Peck-Williamson laundry driers have been installed, and accompanying them are testimonials from pleased purchasers.

Coal and Gas for Cooking.

In discussing a paper read before the New England Association of Gas Engineers, Boston, February 16 and 17, 1898, Mr. Roper presented the following tables to show the loss in weight and time occupied in cooking the several articles named, first by the use of a coal stove, and then by the use of a gas stove:

Coal Stove.

Articles, and how cooked.	Weight.—Before cooking. Lbs.	Before cooking. Ozs.	After cooking. Lbs.	After cooking. Ozs.	Loss. Ozs.	Time. Hrs.	Time. Mts.
Bread, baked	2½	..	2	6½	1½	..	35
Beef, roasted	3	7	2	4½	8½	1	15
Steak, fried	1	4½	1	3	1½	..	8
Chops, fried	....	12	..	10	2	..	11
Chicken, broiled	....	22	..	15	7	..	45
Fish	....	10	..	7½	2½	..	17

30 pounds coal at 8 cents, + kindling, 1 cent, = 9 cents.

Gas Stove.

Bread, baked	2	7	2	5½	1½	..	35
Beef, roasted	4	1	3	9	8	1	..
Steak, fried	....	21	..	19	2	..	8
Chops, fried	....	18½	..	12	1½	..	9
Chicken, broiled	....	16½	..	12½	4	..	14
Fish	....	16	..	13	3	..	14

Cost of gas, 6 cents; quantity consumed, 40 cubic feet; rate, $1.50 per 1,000.

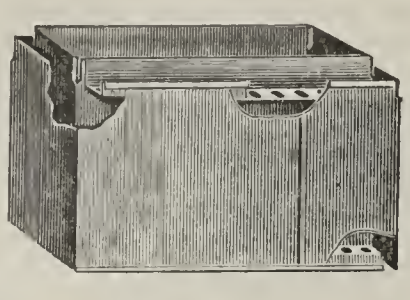
A New L. & H. Catalogue.

The A. J. Lindemann & Hoverson Company, Milwaukee, Wis., favor us with a copy of their 64-page catalogue of stoves and sheet metal goods, showing a varied line of products. They give the leading place in this publication to the L. & H. Crown steel ranges, of which they make a full line in all the standard sizes. These ranges are suited to any kind of coal, and are furnished with a duplex grate which can be inverted for wood. The body is made of polished steel, the walls are lined with asbestos, the oven door is well counterbalanced, the oven is ventilated and much taste is shown in the decorations. L. & H. Junior gasoline stoves with stationary tank come next, followed by L. & H. Star Juniors with removable safety tank, L. & H. Star step Juniors, L. & H. Superb stoves with burner similar to the so-called Process and removable safety tank, L. & H. Superb with step, L. & H. Process stoves with solid German silver valves, L. & H. Process stoves with step, L. & H. Process cabinet stoves, L. & H. lamp stoves, L. & H. Blue Flame oil cooking stoves, L. & H. Blue Flame step stoves, L. & H. Calumet gas ranges, L. & H. gas hot plates, wall torches, ovens for gasoline or gas stoves, roasters, bakers, elbows, stove pipe; L. & H. hard wood refrigerators, &c. The company announce that another and more comprehensive catalogue will be issued by them in July.

The Excelsior Steel Furnace Company, 38 West Monroe street, Chicago, are experiencing a decided boom in business. During the week ending March 12 they booked four carload orders for goods of their manufacture in addition to over 200 smaller orders. Such activity is very unusual at this season of the year.

The Excelsior Sectional Wall Pipe.

Illustrations are herewith given which show the principal features of the new furnace pipe which has just been put on the market by the Excelsior Steel Furnace Company, 38 West Monroe street, Chicago. The Excelsior sectional wall pipe is not only a safety pipe, being made double, so as to provide a protecting air space between inner and outer pipes, but it has the following special points: It ventilates into the partitions and not into the living rooms, is made in very long sections, any



The Excelsior Sectional Wall Pipe.—Fig. 1.—A Section 5⅛ Inches Long.

length of pipe can be had without cutting, the ventilation is so arranged that it cannot be cut off in any manner, and it is claimed to have the best slip. These points are stated more elaborately as follows:

There is no communication between the space between the inner and outer pipes and the registers or living rooms, so that no odors or noxious gases can pass from the basement to the apartments above. A basement which is wholly or partly under ground, and consequently

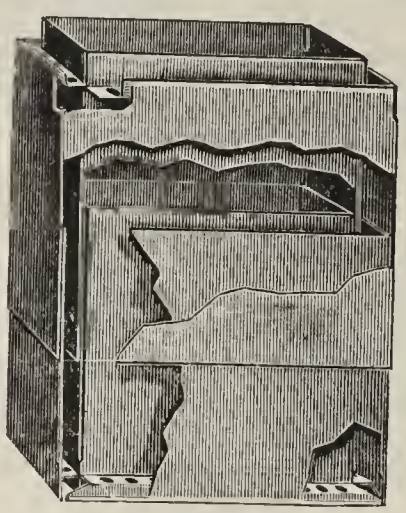


Fig. 2.—The Adjustable Joint Section.

shut out from sunshine, and is used for the storage of vegetables and odds and ends, is not a healthy place from which to take air to be breathed by young or old, and therefore, from a sanitary standpoint, the Excelsior sectional wall pipe is offered to the trade as a distinct advance in furnace pipes.

The Excelsior sectional wall pipe is made in the following lengths: 3⅞, 5⅞, 8⅞, 12¾ and 18¾ inches and 8 feet. Each section is furnished with slip and socket ends, as shown in Fig. 1, and by using the 8-foot sections in con-

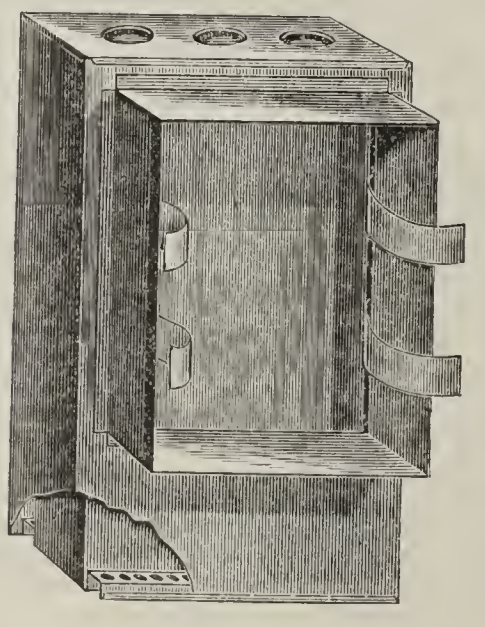


Fig. 3.—A Stack Head

nection with the shorter lengths and with the adjustable joints combinations of any desired length can be made with little labor.

With the Excelsior pipe any desired length, even to $\frac{1}{100}$ inch, can be obtained without cutting. This is accomplished by means of adjustable joints, shown in Fig. 2 (for which patents have been applied). These will be found a long felt want in the sectional pipe trade, for there are numberless places where it is necessary to have a length of pipe to a fraction of an inch, and in the past this could not be obtained without cutting the pipe, and to cut sectional pipe is practically to ruin it, as the slip and socket ends are put on by machinery and they cannot be taken off and put on again properly by hand.

The ventilation is supplied by numerous perforations around the bottom of the boot, and the total area of the openings and their position at the bottom of the foot piece, and near the point where the warm air pipe from the furnace enters the stack, insures ample and absolute ventilation at all times.

The slip on the Excelsior sectional wall pipe is made so that it fits tightly into the socket end prepared to receive it. This enables a tight connection to be made and

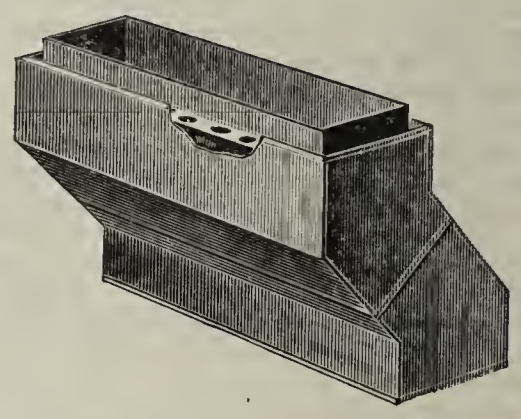


Fig. 4.—Stack Elbows Making an Offset.

reduces the labor and cost of soldering when the sections are soldered together.

The company make the adjustable joints in two lengths, one to adjust from 17 to 10 inches and the other to adjust from 13 to 6½ inches. By the use of these joints it is not necessary to take measurements down to an inch, as one joint to each riser pipe enables the workman to obtain any desired length. These joints are listed with the wall pipe fittings and the saving in time and in the finish of the work will make their liberal use profitable to the dealer.

All combinations possible with the Excelsior standard double pipe and fittings, with which the trade has been long familiar, and with other forms of sectional safety wall pipe, can be made with the Excelsior sectional wall

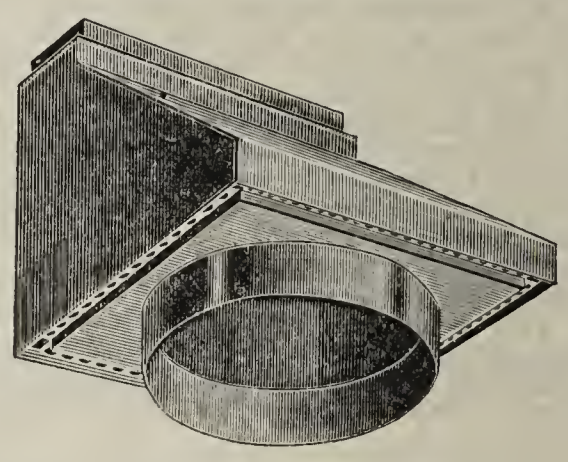


Fig. 5.—A Foot Piece.

pipe, and a few illustrations of various combinations are presented—Fig. 3, a stack head; Fig. 4, stack elbows, and Fig. 5, a foot piece.

The company will carry a large stock of the Excelsior sectional pipe and will be in a position to furnish promptly any quantity which may be desired. For dealers who wish to keep the pipe in stock, crates are put up containing about 50, 75 and 100 feet each. The 50-foot crate contains the following: Four 8-foot lengths, eight 18¾-inch sections, and two each of the smaller sections, making a total of 49 feet 8¾ inches. The 75 foot crate contains one-half more than the above and the 100-foot crate just twice the quantity named.

The Excelsior line of standard wall piping, of which many millions of feet have been sold during the past 12 years, will still be made on the same scale as heretofore, and the new sectional pipe is simply an addition to the company's general line and will in no way interfere with the manufacture and sale of the old line of double and single stacks.

A. C. Barstow of the Barstow Stove Company, Providence, R. I., visited Judson A. Goodrich, manager of the New York office, this week.

ODD PLATES.

The Fuller & Warren Company of Troy, N. Y., favor us with a copy of illustrated catalogue and price-list D, describing French or Flat Top Ranges, especially adapted for the use of "particular cooks who desire to make delicate, delicious, palatable and healthy dishes." These Ranges are made in both brick and portable form, and are easily and quickly changed from one to the other. They have right or left hand fire box, and are fitted with sheet flues arranged so that the products of combustion pass immediately under all six top boiler holes and come in contact with five sides of the oven, thus insuring even baking, quick operation and making each of the boiler holes available for cooking. Other features include triangular grate, which is easily removed through the ash pit without disturbing the water heater or plumbing; large bailed ash pan, wrought steel ventilated oven, cut long center; Reed's check draft damper, large drop broiling door and large warming closet. The pamphlet shows a number of styles of these Ranges, each illustration being accompanied by tables giving various dimensions and enumerating important features of construction.

The contract for building the foundations of the new addition to the Stove works of Rathbone, Sard & Co., at Aurora, Ill., has been awarded to Fred. Esser, who is pushing operations as rapidly as possible. The new structure, intended for use by the offices, will be 29 x 95½ feet in size and three stories high above the basement.

Eugene Munsell & Co. have just received at their offices in New York and Chicago samples of the Yukon Folding Lanterns, in which mica is used to a very large extent. The Lantern is a very neat affair and when folded can be easily carried in the pocket, Munsell & Co. having furnished large quantities of mica to the manufacturers of these Lanterns, of which hundreds are made and sent to the Klondike regions. The company state that a very clear and lustrous mica, of which they make a specialty, is necessary for this work.

The Minnesota Stove Company of Shakopee, Minn., have recently brought out a Steel Range which is known as the Matchless Steel Coral, having large ventilated oven, cast iron reservoir, oval fire box, heavy ventilated linings, combination duplex grate, high closets, end shelves, &c. The oven doors are balanced by springs concealed within and which tend to prevent the doors from dropping suddenly. The grate can be easily put in place or drawn out through a drop door opening, and there are other features likely to interest the trade. We understand that the range is meeting with a good demand and that the manufacturers are making shipments every few days.

A catalogue of 24 large pages which has just come to hand shows some very handsome specimens of Wood Mantels and Tile Fire Places which are being manufactured by the Conway Cabinet Company, St. Paul avenue, Twentieth and Twenty-first streets, Milwaukee, Wis. Various designs of Mantels are presented in well executed half tone engravings, while the accompanying text gives the principal dimensions, together with directions for setting.

It is reported that Bridgeford & Co. will shortly begin the manufacture of Steel Ranges at Fifth and Main streets, Louisville, Ky.

Isaac Everitt, founder of the West Superior Stove Works, West Superior, Wis., died on March 9, at his home in West Pittston, Pa., aged 79 years. Mr. Everitt was largely interested in the West Superior Stove Works at the time of his death. He was also connected with the Pittston Stove Company of Pittston and with a number of other enterprises in the Wyoming Valley.

We are indebted to the Peninsular Stove Company of Detroit, Mich., for a copy of a circular or folder which they are distributing among dealers in the trade, showing the estimation in which Peninsular Stoves and Ranges are held by some of those who have handled them in a commercial way. The folder is illustrated with views of some of the Peninsular goods, the list including the Active Peninsular Planished Steel Range, the Granite Peninsular Steel Oven Six-Hole Range, the Reliable Peninsular Wood Cook and the Family Peninsular Coal and Wood Cook. The testimonial letters are from sections both East and West and speak in very flattering terms of the Peninsular line. Another feature of the folder is a *fac-simile* of the guarantee bond given by the company with every Stove, Range and Furnace which they manufacture.

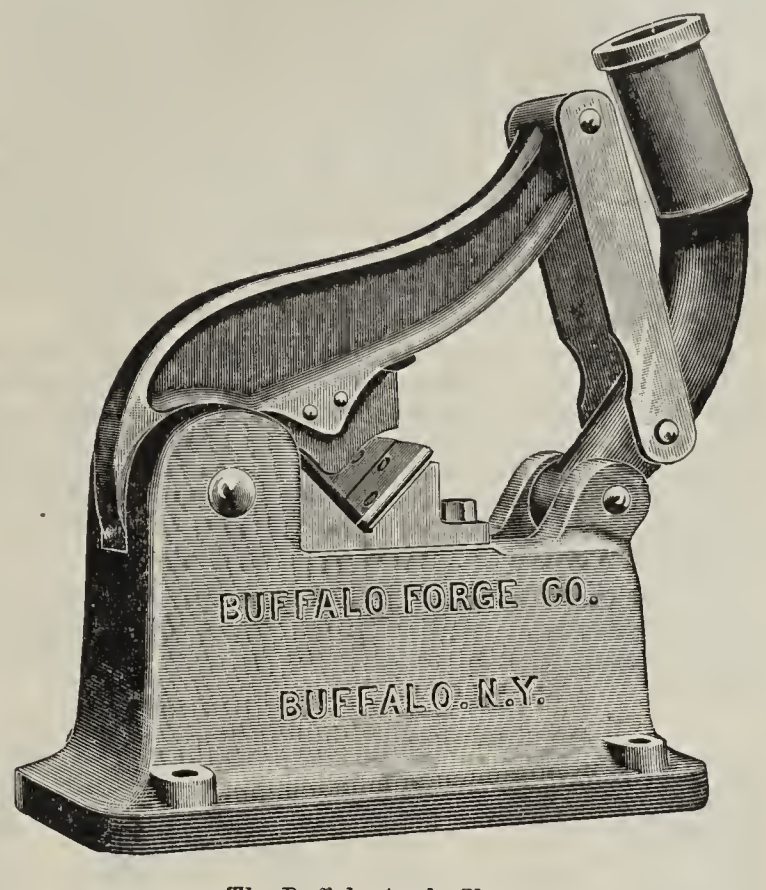
The D. M. Steward Mfg. Company of Chattanooga, Tenn., have recently doubled their capacity for foundry facing and iron workers' crayons. The goods are now being sold in many foreign countries.

S. E. Newhall, well known to the Stove trade through his connection with the Magee Furnace Company, Boston, was recently elected selectman of Hyde Park, Mass., for a third term. Mr. Newhall was chosen chairman of the body, but declined to serve owing to pressure of other business.

The Ideal Stove & Foundry Company of Daleville, Delaware County, Ind., were recently incorporated, with a capital stock of $25,000. The directors are George B. Jones, Charles Bartholomai, William J. Smith, Lewis W. Moats, Frank Graham, John T. Connolly and George P. Barber.

The Buffalo Angle Shear.

The angle iron shear built by the Buffalo Forge Company of Buffalo, N. Y., is adapted especially for sheet and structural iron workers and cornice and fence makers, as well as bridge builders. It is compact and powerful and the operator can work without a helper. The design of



The Buffalo Angle Shear.

the tool will be understood fully from the engraving. The No. 16 shear will cut up to 3 x 3 x ¼ inches angle iron or steel.

TRADE NOTES.

The attention of our readers is directed to the advertisement of the Ferrosteel Company of Cleveland, Ohio, elsewhere in this issue. The business of this concern has attained a large volume and the goods manufactured are referred to as of high quality, not only in the metal, but also in the workmanship. They claim to have made a very marked success in electroplating in colors and call attention to the particularly large list of sizes which they make. Their Ferrosteel Special Sad Iron works are being operated successfully with special facilities devised by the company. The new Blue Book for 1898 is a most interesting little publication, and any one desiring to see it should write the Ferrosteel Company for a copy.

The Eureka Metal Works of New York City have been incorporated, with a capital of $2500, by Alexander Stern, Marx Blum and Nathan Gutman.

A shipment of 115 tons of Virginia Spelter was made last week to Calcutta, India, on an order from the East Indian Ordnance Department. The requirement was for Zinc of exceptional purity.

The brass foundry at Worcester, Mass., which has been owned and operated since 1882 by Luther Shaw & Son, was sold last week to W. E. Oakley & Son, and hereafter will be run under that name..

Dufferin, Shurman & Co. of Detroit, Mich., have been incorporated, with a capital stock of $10,000, to manufacture and sell Diamond Gloss Stove Polish and other articles. The incorporators are Otto H. Schnepper, George F. Shurman, Edith Dufferin and Carl Schnepper.

A. Mugford, who for about 20 years has been established in Hartford, Conn., and has a wide connection with the Hardware, machinery and metal trades, has now opened a branch house at 120 Liberty street, New York, where he will carry on a similar business in wood engraving, half-tone, photo-zinc etching, wax engraving and electrotyping. This department of the concern while soliciting trade from any in need of their services will pay especial attention to New York, New Jersey, Pennsylvania and Ohio territory. The business in this city is in charge of Henry Mugford.

TRADE REPORT.

METAL MARKET.

Pig Tin.—During the past week the market has not changed materially. At one time prices seemed to have a tendency to sag, as the result of heavier arrivals here and exceedingly large shipments from the Straits Settlements in the first half of this month, but the consumptive demand and jobbers' purchases, both of which have been fairly liberal, have served to steady the market again. Speculative interest, however, has been tame. In a retail way Straits Pig is firm at 14¾c. to 15¼c. per lb. The Metal Exchange figures the arrivals so far this month at 1260 tons, with 3225 tons afloat. The shipments from the Straits for the first half of the month are figured at 2720 tons, against 1465 tons at the same period last year.

Copper.—The market during the entire week has been quiet, and, despite rumors to the contrary, it is understood that no sales of especial importance have been made in the week. Nevertheless, wholesale prices are still held very firmly, and the strength of the metal has extended to jobbers' prices, which have been fractionally advanced. Lake Ingot in small lots from stock sells at 13¼c. per lb. and Ansonia grade Casting Copper at 12½c.

John Stanton reports the Copper production in the United States and of the foreign reporting mines and United States exports as follows, in gross tons of 2240 pounds :

	Reporting mines.	Outside sources.	Total U. S. product.	Product foreign mines.	U. S. exports.
First half 1895....	70,612	9,100	79,712	42,484	34,215
Second half 1895..	84,885	6,600	91.485	43,674	30,507
Total 1895...	155,497	15,700	171,197	86.178	64,722
First half 1896....	94,180	7,200	101,380	42,255	58,216
Second half 1896..	95,314	7,200	102,514	43,941	67,287
Total 1896.....	199,494	14,400	203,894	86,196	125,503
First half 1897....	103,651	5,000	108,651	44,263	64.870
Second half 1897..	100,555	6,900	107,455	44,007	64,340
Total 1897.....	204,206	11,900	216,106	88,270	129,210
January, 1898.....	16,544	1,200	17,744	5,556	11,030
February, 1898....	16,072	1,250	17,322	7,303	9,611

Sheet Copper.—Purchases have been of very fair total amount and the volume of inquiry, especially in connection with the building trade, is such as to encourage the hope of a very satisfactory business in Cornice Copper during the coming season. In sympathy with the strength of the raw material dealers have advanced the price of Sheet Copper 1c. a lb. In retail quantities from store it is now quoted at 16c. per lb. basis. Copper Bottoms, Pits and Flats have been likewise advanced to 20c. per lb. basis.

Pig Lead.—Buyers are still the masters of the situation. They have been a little scarce during the last week too, and whenever one wandered within the reach of a seller he had things pretty much his own way. Business has been very quiet and the consumptive demand in this section is of very ordinary proportions. Small lots of American Pig from store are quoted by jobbers at 4⅛c. to 4¼c. per lb.

St. Louis advices are as follows: Pig Lead continues exceedingy active. Offerings are limited and buyers find it impossible to shade the market. As a rule, consumers are practically uncovered and must soon enter the market.

Lead Pipe and Sheet.—There is rather more life in this department, athough the total business effected by the dealers was hardly up to expectations. The outlook is better, however, and inquiries indicate a reviving interest on the part of consumers. Jobbers' prices in this section are unchanged at 5½c. per lb. for Lead Pipe and 6½c. for Sheet Lead, subject to the customary discount.

Spelter—Is quiet but firm. The large exporting which is still going on via Southern ports is still keeping the market in a good position. Supplies for home consumption are rather limited, but seem to be adequate to the limited consumptive demand. Jobbers' prices for good Western brands in small lots from store are rather higher at 4.65c. to 4¾c. per lb.

St. Louis advices are as follows: There is very little Spelter being offered for March delivery, and sellers evince no disposition to sell for later delivery except at higher prices. The market is in excellent shape and higher prices are predicted.

Sheet Zinc.—Sales are of routine type and the demand shows no special animation. Prices show no variation, jobbers quoting 600-lb. cask lots at 5⅝c. to 5¾c. per lb. and smaller quantities at 6⅛c. to 6¼c.

Antimony.—The situation as regards this metal is unchanged. A fairly good demand and light stocks combine to keep prices firm. Small parcels from stock are quoted at 8½c per lb for Cookson's, 7¾c. to 8c. for Hallett's and 7½c. to 7¾c. for Japanese.

Nickel—Is quoted at 37c. per lb. for small lots.

Aluminum.—The demand for this metal is referred to as good. Prices are as follows: No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb.; 100-lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb.; 100 lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb.; 100-lb. lots, 30c.

Tin Plate.—Although wholesale prices are about the same as last week, there is an approaching feeling of steadiness in the trade. It is felt that the large consumers who have been holding off on account of the uncertainty regarding the proposed consolidation of Tin Plate mills must shortly come into the market for their supplies, and the rush then expected should send prices materially above the present low level. The early spring-like weather which prevails all over the country promises, unless a severe frost ensues, to insure large and early crops, and the canning trade is looking for an unusually heavy and early pack The requirements of those canners and can makers, which are not yet covered, are believed to represent a very heavy amount and a number of the manufacturers of tinware are also understood to be in a similar position. This should mean a large purchasing movement before long, and on this development the better tone of the market is based. In many quarters, indeed, a scarcity of Tin Plates in the coming summer is regarded as among the probabilities. Taking these influences together, it would seem that at least a moderate advance in prices must be looked for in the near future. The consolidation scheme seems to be in abeyance for the time, as most of the committee having it in charge are absent on vacation. Nevertheless, it is asserted in some quarters that the plan is not dead, but has assumed tangible shape in Chicago. In any event, it is becoming recognized by consumers and the trade at large that, even if carried through successfully, the consolidation can exert no real influence on the market this season. A fair retail business is noted, which is stimulated by the advent of spring-like weather. Jobbers' prices are unchanged. Small lots of American Plates for spot delivery at New York, Philadelphia and Baltimore are quoted about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20. $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. Foreign Plates are selling slowly, and prices are largely nominal.

Chicago advices are as follows: As far as can be learned all the Tin Plate factories in this vicinity are sold up until July, if not further. Prices are very firm.

Sheet Iron.—There is a continued good demand, although perhaps not quite as heavy as earlier in the month. Nevertheless, the mills are running full, and some have all the orders for Black Sheets they can take care of for the next two or three months. The demand for Galvanized Sheets is quite heavy. Prices, while firm, show no quotable change. Jobbers in this quarter quote small lots of No. 27 Common Black Sheets at 2.40c. and 80 per cent. off for Galvanized Sheets.

Chicago advices are as follows: The Sheet market is quiet. The mills, however, are reported very busy on old orders and prices are unchanged. Jobbers continue to quote small lots from stock at 2.30c. to 2.40c. for No. 27 Black and 80 and 2½ to 80 and 5 per cent. off for Galvanized.

Old Metals.—The makret for almost all varieties of Old Metals is very firm, with an advancing tendency in prices. Home consumers have been urgent buyers of round lots of light and heavy Brass and Copper, taking all the supplies in sight. Available spot stocks are reported very light. The export business has been lighter, on the other hand, as exporters offering figures fall considerably below those paid by home buyers. The Scrap Tin market is weak and flat. In Scrap Iron some articles are stronger than others, but the demand is good and holders are enabled to maintain a higher level of prices. Yard dealers

in this city and vicinity are paying the following rates for moderate sized lots, delivered here:

Heavy Copper	per lb. 9⅞c.
Light and Tinned Copper	per lb. 9¼c.
Heavy Brass	per lb. 6½c.
Light Brass	per lb. 5½c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3¼c.
Zinc	per lb. 3 c.
Zinc Dross	per lb. 2.70c.
Zinc Skimmings	per lb. 1.10c.
Sal ammoniac Skimmings, per ton	$20 to $24
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$8 25
Heavy Cast Scrap, per gross ton	8.25
Stove Plate Scrap, per gross ton	5.75
Burnt Iron, per gross ton	4.25
Tin Plate Scrap, per ton	2 25

THE IRON MARKET.

The Iron trade has moved along steadily during the past week, in spite of the troubled times. We cannot discover many evidences that business has been held back awaiting developments. On the other hand, orders for the raw material for war equipment are shrouded with much secrecy. It is a fact, nevertheless, that considerable tonnage has been placed for Pig Iron and for Steel. Thus we hear of one block of 5000 tons of Special Pig for a projectile concern.

Quite a number of meetings of manufacturers have been held during the past week all looking to some scheme to take off the keen edge of unbridled competition.

A group of Wire makers of the West and Central West are trying to put the finishing touches on a consolidation, the parties interested being the Consolidated, Salem, American Wire Nail, Elwood, H.P. and American Wire companies. The latest advices are that the meeting has been postponed until Friday to enable two companies to get the necessary preliminaries adjusted. All the others named as going into the new consolidation have signed the agreement. The new company will probably not be formed till after April 1, as some hope is still felt that the great consolidation may be accomplished. The companies going into the new deal are said to have earned 80 per cent. of all money made by Wire interests of the country in 1897.

The representatives of the majority of furnaces in Alabama and Tennessee are in session working at their gentlemen's agreement. At least four plants are not represented. Some good is expected through the better understanding growing out of a frequent comparison of notes.

Pig Iron.—Aside from a round block of about 5000 tons taken by a Pipe shop, there have been only small sales in the New York market, and prices are no better. A number of the representatives of Southern interests have been in session in this city. We quote as follows: Northern brands, No. 1, $11 to $11.50; No. 2, $10.50 to $11; No. 2 Plain, $10 to $10.50. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.50; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

In the Philadelphia Pig Iron market competition for new business is extremely close, but it is only here and there that cut prices are made. Some brands are held at absolutely firm figures, others usually because of exceptional circumstances can be had once in awhile without much regard to the general market. There ought to be a more active movement during the next few weeks, but the indications in that direction are not as clearly defined as the trade would like them to be. Meanwhile general quotations for seaboard delivery are about as follows, with the usual rebate according to freights at points within a radius of 100 miles south or west: No. 1 X Foundry, $11.75 to $12; No. 2 X Foundry, $10.75 to $11; No. 2 Plain, $10.40 to $10.50.

While inquiries are still coming in for considerable quantities of Pig Iron in Chicago actual sales have been light for several days. The local furnaces, however, are hardly in a position to take more orders. All of them are sold up for months to come and are having trouble to make deliveries to satisfy their customers. Even off grades are now taken eagerly by consumers who are usually very exacting in their requirements. Most of the business placed in the past week has been secured by Southern furnace companies. They are alleged to have shaded prices to some extent, but this hardly seems necessary, considering the well filled order books of most of the furnace companies doing business in this locality. The scarcity of malleable castings is as pronounced as before. We quote for cash as follows:

Lake Superior Charcoal	$12.00 to $13.00
Local Coke Foundry, No 1	11.50 to 12.50
Local Coke Foundry, No. 2	11.00 to 12.00
Local Coke Foundry, No. 3	10.50 to 11.50
Local Scotch, No. 1	11.50 to 13.00
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.35 to 10.70
Southern Coke. No. 3	10.10 to 10.40
Southern, No. 1 Soft	10.85 to 11.00
Southern, No. 2 Soft	10.35 to 10.70

There is not much inquiry in the Pittsburgh Pig Iron market. Foundry Irons are neglected. The foundry trade seems to be drifting toward Cleveland, some of the foundries in the Pittsburgh district only running about half time. We quote, f.o.b. Pittsburgh: No. 1 Foundry, $10.40 to $10.50; No. 2 Foundry, $9.90 to $10; Bessemer, $10.35 to $10.50, depending on delivery.

In the Cincinnati district the market for Southern Pig Iron has presented no very striking features during the past week. Business has been quiet even to the verge of dullness. The usual run of small orders has continued, but throughout this field there has hardly been a sale or even an inquiry of any moment. The question of price does not seem to cut any figure in the situation just now. Buyers seem indifferent both as to outside and inside quotations. Deliveries of Pig Iron are all that could possibly be asked. Quotations remain nominally unchanged. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.25 to 9.50
Southern Coke, No. 3	9.00 to 9.25
Southern Coke, No. 1 Soft	9.50 to 9.75
Southern Coke, No. 2 Soft	9.25 to 9.50
Southern Coke, Gray Forge	8.50 to 8.75
Southern Coke, Mottled	8.50 to 8.75
Ohio Silvery, No. 1	12.00 to 12.50
Ohio Silvery, No. 2	11.50 to 12.00
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00

The St. Louis Pig Iron market is referred to as practically featureless. Prices continue to be unsettled and there is nothing in the immediate future to warrant the prediction that prices are likely to improve. That the output for the month of February is not being absorbed is evidenced by the stocks on hand, which show an increase of 23,410 tons on March 1 in comparison with the stocks on hand February 1. Sales during the week have been largely confined to carload lots for immediate shipment. We quote as follows for cash, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$10.00 to $10.50
Southern, No. 2 Foundry	9.75 to 10.00
Southern, No. 3 Foundry	9.50 to 9.75
No. 1 Soft	9.75 to 10.00
No. 2 Soft	9.50 to 9.75

CHICAGO REPORT.

Scrap.—The situation is unchanged, the demand being good and prices fairly firm. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	7.50	....
Malleable Cast	6.50	....
Stove Plate (free of burnt)	5.50	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.50	....
Old Gas Pipe and Boiler Tubes	6.00	....
Cast Borings	3.50	....
Turnings	5.00	....
Horseshoes	9.00	....
Copper Wire and Heavy	....	10¼c.
Copper Bottoms	....	9¼c.
Copper Clips	....	10 c.
Red Brass	....	8⅛c.
Yellow Brass	....	7½c.
Light Brass	....	5¼c.
Pipe Lead	....	3 c.
Tea Lead	....	3 c.
Zinc	....	3¼c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	..	1 c.

Anthracite.—The demand is light, as usual at this season. The prices of carload lots of 12 tons minimum are as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	7.00	7.25
Council Bluffs, Iowa	7.00	7.25
Lincoln, Neb	7.15	7.40
Sioux City, Iowa	7.50	7.75
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.00	7.25
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	7.00	7.25
Leavenworth, Kan.	7.00	7.25
Omaha, Neb	7.00	7.25

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

With the advance of the season and the coming of spring-like weather there is an increased activity in the demand and a more liberal movement of goods, particularly in seasonable specialties. In the parts of the country, however, in which trade is assuming normal proportions there is an evident improvement in Builders' Hardware and in Shelf Goods generally, indicating a more prosperous condition of trade than for some time. Prices show some changes, there being a weaker tone in the lines directly affected by the failure to unify the Wire interests, and Wire Nails, Barb Wire and Wires generally are quotably lower. The efforts made by the manufacturers to maintain prices may perhaps check this, especially as the season for active demand is at hand. The higher prices ruling in Copper have affected this line favorably, and prices for Sheet and Bolt Copper, Copper Rivets and Burrs, Brass and Copper Wire, &c., are higher and the market for this line has a firm tone. On the great bulk of goods there are no quotable changes to report. Those in contact with business in the West and Southwest refer enthusiastically to the improvement which is noticeable in that section. In some parts of the country there is still a good deal of complaint of the sluggishness of trade, a condition to which the talk of the possibility of war contributes something, as its natural influence is to postpone the contemplation of enterprises and deter the immediate adoption of a more vigorous prosecution of business, which would otherwise be in order. There is little doubt, however, that trade throughout the country is getting into much better shape in view of the increased prosperity of the people and the larger employment of labor. The Hardware trade, both jobbers and retailers, are certainly in a better condition for the satisfactory conduct of business because of the attention which has recently been given to the necessity for the correction of practices which have militated against their success, and for the adoption of wise and enterprising methods. In addition to the protection which both of these classes of merchants seek to secure for their own interests, the consideration of business methods and the educating influence of their associations are beneficial results which come from such organizations. The desirability of having these movements extend further among the retail trade is thus emphasized, especially as retailers are not organized nearly as generally or as efficiently as are the jobbers. The success of the retail associations in several States certainly gives substantial encouragement to their establishment in others.

Advices from Chicago.—Jobbers report trade decidedly active. The demand is quite general, seasonable and staple goods, Tools, Builders' Hardware and House Furnishing Specialties figuring in almost every order. The trade in Nails and Fence Wire is increasing with the advent of spring. The drying of country roads and the mild weather are having a stimulating effect. The packing and shipping departments of the local houses are now obliged to work at night in order to keep up with the movement of goods. Tinware and Metals have been in much better demand. The movement of such merchandise is now up to the expectations of the season. Galvanized Sheets are being taken more freely by consumers, and Roofing Tin is also going out better, but the trade in the latter is running to the cheaper grades. Black Sheets are quiet, the only orders now booked being for future delivery. Heavy Hardware jobbers probably never had a better demand for Wagon Stock than at this time. Their shipments are very large. The demand for Iron and Steel, however, is stated to lack vigor, being affected by the apparent weakness in mill prices, yet jobbers assert that they are unable to secure prompt deliveries from the mills, and their stocks are broken.

Advices from St. Louis.—The Hardware trade continues to show daily improvement. The trade from Kansas, Nebraska and Texas is larger than for years past, and a favorable feature of the situation is the number of accounts which are being discounted by dealers who have heretofore made 60 days' settlement. The demand for Shelf Goods is extremely heavy, and orders for new stocks are becoming so plentiful that they now pass without comment. Bicycles are commencing to move, and the indications are that a larger number of high grade wheels will be sold than last year. There are plenty of cheap wheels on the market, however, and the coming summer is likely to find a heavy increase in Bicycle riders. Builders' Hardware and Mechanics' Tools continue free sellers, and the open weather which has prevailed for two weeks past has caused a heavy demand for Garden Tools. Collections are most excellent, and, as above stated, many accounts are being liberally discounted.

NOTES ON PRICES.

Wire Nails.—The past week has been characterized by more or less irregularity in the Wire Nail market, owing to a weakening in prices on account of the failure to consummate the consolidation of Wire interests. As a result the market is lower than for a number of weeks, and is at present a little unsteady. What the future course of the market may be remains to be seen. A number of conferences have been held by leading manufacturers with a view to coming to some kind of an agreement more or less formal with the object of maintaining the price, and some plans are under consideration for forming an organization including some at least of the leading mills. In view of the fact that the negotiations for controlling Wire products are generally understood to have reached an unsatisfactory termination the trade are indisposed to purchase at all freely in the lines immediately affected, and consequently have been holding aloof from the Nail market, except as their necessities compelled them to purchase. The competition between the different mills is in some respects especially active, and more or less irregularity in price results. This is the case in the New York market, where prices on dock and from store are lower than usual as compared with the factory price. Small lots from store are quoted at $1.65 to $1.70.

Advices from Chicago.—Jobbers quote small lots from stock at $1.55 to $1.60. The outlook is reported very good by all jobbers, as the demand has not only increased considerably since the appearance of spring weather, but retailers have bought quite conservatively for some time and it is not believed that the country is stocked to any extent.

Advices from St. Louis.—The market continues in excellent condition. There is a heavy demand for Wire Nails and the price is being firmly maintained. With a heavy spring trade in sight, dealers are likely to find prices considerably higher before the month is out even if there is no combination formed. Jobbers ask $1.65 to $1.70, base, for small lots from store.

Cut Nails.—Unaffected by the fluctuations which have occurred in the Wire Nail market, Cut Nails continue steady. The volume of business is fair and increasing with the advance of the season. Prices in New York are as follows: Small lots from store, $1.25 to $1.30.

Advices from Chicago.—A little improvement is noted in this line, orders being rather better than during the opening months of the year. Prices on small lots are unchanged at $1.45.

Advices from St. Louis.—The Cut Nail market continues unchanged. Jobbers ask $1.40 to $1.45 for small lots from store.

Barb Wire.—The Barb Wire market reflects to a certain extent the condition of things which prevails in Wire Nails, but prices are somewhat better maintained. The demand continues good and the prospect for a large business during the season is excellent.

Advices from Chicago.—Manufacturers and jobbers report this branch of trade in good condition, shipments from factories being very heavy, while jobbers find that their customers are purchasing more freely. Small lots from stock are selling at $1.60 to $1.65 for Painted and $1.90 to $2 for Galvanized.

Advices from St. Louis.—Mills report a very heavy demand for Barb Wire and are shipping their output as soon as it is on the reels, having practically nothing to put in their warehouses. Prices are well maintained. Jobbers are in receipt of liberal orders and quote Painted at $1.70 to $1.75, with the usual advance for Galvanized.

Copper Rivets and Burrs.—In sympathy with the advance in Copper, the manufacturers of Copper Rivets and Burrs have advanced their prices until the market is now represented by discount 60 and 10 and 10 per cent. It is characterized by a firm tone.

Sheet and Bolt Copper.—On account of the condition of the Copper market the prices on Sheet and Bolt Copper are quotably higher, having been advanced ½ cent to 1 cent a pound.

Sheet Brass, Brass Wire, &c.—On account of the advances which have taken place in Copper, higher prices are named by the manufacturers on Sheet Brass, Brass Wire, &c. The quotations now ruling are represented by the following discounts, which relate to quantities of 100 pounds or more in one order:

	Per cent.
Roll and Sheet Brass	40
Patent Leveled Sign Brass	30
Platers' Metal, thinner than No. 38	40
Slitting Charges (Brass)	40
Sawing Charges (Brass)	40
Jewelers' or Gold Metal	40
Printers' 2 x 4 Sheets and Galley Sheets	40
High Brass Rods	40
Wire in Coils (No. 20 or coarser), excepting Copper Wire	40
Spooling Wire (Brass)	40
Brazed Brass Tubing	45
Brass Moldings	45
Door Rail	45
Iron Lined Brazed Tubing	47½

3000 to 5000 feet, 47½ and 5 per cent.; 5000 to 10,000 feet, 47½ and 10 per cent. discount; over 10,000 feet, 47½ and 12½ per cent. discount.

	Per cent.
Brass Segments	40
Brazed Taper Tubes	45
Angle and Channel Brass	45
High Brass Scrap	7½ cents net.
Low Brass Scrap	8½ " "
Gilding and Rich Gold Metal Scrap	9½ " "

Terms of payment, net cash 30 days, or ½ per cent. off for cash in ten days from date of invoice.

Freight paid in lots of 100 pounds or over to points in the United States on or east of the Mississippi River.

Wrought Iron Pipe.—Prices on Wrought Iron Pipe are somewhat higher this week. For retail lots, three 10's above the base discount are quoted instead of four 10's as heretofore.

Soldering Coppers.—Following the advance in the price of raw material, Soldering Coppers show an advance of about 1 cent per pound. Dealers quote them now at 16 to 17 cents.

Range Boilers.—An advance of about 5 per cent. has been made in the price of Galvanized Iron Range Boilers this week. The following are the discounts now quoted by dealers:

	Per cent.
Galvanized Iron Range Boilers to and including 52-gallon	70 and 5
Galvanized Iron Range Boilers above 52-gallon	60
" " " " extra heavy, to and including 52-gallon	65 and 5
Galvanized Iron Range Boilers, extra heavy, above 52-gallon	50 and 5

Glass.—The local market is spiritless and devoid of special features. Demand is limited, 85 and 15 per cent. discount having become quite a common quotation, and reports are current of this price being shaded. It is understood that a large Cleveland concern, jobbers of Glass, have purchased a Glass factory, at which they will manufacture Window Glass with which to supply the trade. The cause of this purchase is attributed to dissatisfaction of the course pursued by the American Glass Company toward jobbers.

White Lead.—The demand for White Lead in Oil is fair, having shown some improvement with the advent of fair weather. Prices remain unchanged. Manufacturers are accepting orders for delivery not later than May 1. This does not necessarily mean an advance, as Pig Lead values are the factor in the price of White Lead.

Red Lead.—The movement of Red Lead continues moderate, with prices firm.

Linseed Oil.—The demand for Linseed Oil is limited, but shows some improvement over the corresponding date of last month. Western and other out of town competition has a tendency to depress values.

Spirits Turpentine. —Local buying is confined to small lots, the recent speculative manipulation of the Savannah market having a tendency to restrict purchases. Buyers are covering immediate requirements only, and express confidence in lower prices for the future.

Old Rags, Paper, &c.—A fair amount of activity prevails in Paper Stock, with most grades in good demand. Local dealers are paying about the following rates for New York City delivery:

No. 1 White Rags	per lb.	2⅝ to 2¾c.
No. 2 White Rags	per lb.	1¾ to 1⅝c.
Mixed Rags	per lb.	1 c.
Blues and 3ds	per lb.	1 c.
Hard Sized White Shaving	per lb.	1¾ to 2 c.
No. 1 White Book Shavings	per lb.	1½c.
No. 2 White Book Shavings	per lb.	¾ to 1 c.
Light Book Shavings	per lb.	½ to ¾c.
No. 1 Mixed Shavings	per lb.	¾ to ⅞c.
No. 2 Mixed Shavings	per lb.	½ to ⅝c.
No. 1 Printed Books	per lb.	⅞ to 1 c.
Ordinary Mixed Books	per lb.	½c.
Newspapers	per lb.	½ to 3/5c.
No. 1 Manila Paper	per lb.	⅝ to ¾c.
No. 2 Manila Paper	per lb.	⅜ to ½c.
Bogus Paper	per lb.	⅜c.
Common Paper	per lb.	¼ to 3/10c.
Straw Chips	per lb.	⅜c.
Binders' Clippings	per lb.	½c.
Jute Butts	per lb.	1⅛ to 1¼c.
No. 1 Jute Bagging	per lb.	¾ to 1 c.
Mixed Bagging	per lb.	½ to ¾c.
No. 2 Bagging	per lb.	½ to ¾c.
Hemp Twine	per lb.	1⅜ to 1¾c.
Manila Rope	per lb.	1¾ to 2 c.
Jute Rope	per lb.	1½ to 1¾c.
Mixed Rope	per lb.	¾ to ⅞c.

Old Rubber.—A fair demand is noted and prices show no quotable change. Local dealers are paying about the following figures:

Car Springs, ton lots, per lb	3½ c.
Rubber Shoes, carloads, delivered at factory, per lb	4¾ to 5 c.
Rubber Shoes, less than carloads, per lb.	4.70c.
White Wringer Rolls, per lb	4 c.
White Syringes, per lb	4 c.

A London cable dispatch announces the death, on Monday, March 14, of the inventor of the Bessemer process, Sir Henry Bessemer, whose name is inseparably connected with the development of the steel industry. He was 85 years of age.

Larsen & Carpenter, dealers in Farm Implements and Fuel, Crookston and Fosston, Minn., have bought the Hardware business of the late O. E. Stovern, at McIntosh, Minn., which will be carried on there under the firm style of Larsen, Carpenter & Co. Paul Carpenter, associated with the Fosston store for several years, will take charge of the McIntosh establishment. The stock thus acquired comprises Shelf and Heavy Hardware, Tinware, Agricultural Implements, &c.

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Metal and Miscellaneous Prices.

CHICAGO, MARCH 17, 1898.

Tin—

Straits pigs.....15¾@16¢

American Tin Plates—

American Base Box Quotations.

Based on 32,000 square inches in a box, which is exactly 2 per cent. more than in the English base box of 14 x 20 Tin Plates. The American base box weighs 110 ℔ and the English base box 108 ℔.

Highest Grade Charcoal—Bright.

Size.	Base.	Contents.	Per box.
10 x 14,	110-℔	...240 sheets	$5.65
"	140-℔	" "	7.25
12 x 12,	110-℔	" "	5.75
"	140-℔	" "	7.50
14 x 20,	110-℔	....120 "	5.65
"	140-℔	" "	7.25
"	160-℔	" "	8.85
"	180-℔	" "	10.45
"	200-℔	" "	13.15

20 x 28 double the price of 14 x 20.

12½x17, 140-℔....120 sheets..... 5.35
" 180-℔.... " " 6.95

Second Grade Charcoal—Bright.

10 x 14, 110-℔....240 sheets..... 5.10
" 140-℔.... " " 6.15
12 x 12, 110-℔.... " " 5.25
" 140-℔.... " " 6.30
14 x 20, 110-℔....120 " 5.10
" 140-℔.... " " 6.15
" 160-℔.... " " 7.25

20 x 28 double the price of 14 x 20.

Highest Grade Coke—Bright.

10 x 20, 110-℔....240 sheets..... 5.75
12 x 12, 110-℔.... " " 4.15
" 140-℔.... " " 4.95
14 x 20, 110-℔....120 " 4.00
" 140-℔.... " " 4.85

20 x 28 double the price of 14 x 20.

20x26½, 110-℔....120 sheets..... 8.00
20x29½, 110-℔.... " " 8.85
20x32½, 110-℔.... " " 9.90
", 140-℔.... " " 12.35
20x39½, 140-℔.... " " 15.00

Old English Method Quotations

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$5.25
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	6 75
	IXX, 14 x 20	8.25
	IXXX, 14 x 20	9.75
	IXXXX, 14 x 20	11.25
	DC, 12½ x 17	5.00
	DX 12½ x 17	6.50
Allaway Grade.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	4.75
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	5.75
	IXX, 14 x 20	6.75
	IXXX, 14 x 20	7.75
	IXXXX, 14 x 20	8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	IC, 10 x 14; IC, 12 x 12; IC, 14 x 20	$3.75
	IC, 10 x 20	5.50
	IC, 17 x 17	7.75
	IC, 20 x 26½	7.75
	IC, 20 x 29½	8.50
	IC, 20 x 32½	9.00
	IX, 10 x 14; IX, 12 x 12; IX, 14 x 20	4.50
	IX, 20 x 32½	12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔.....15¢
95 ℔.....20¢
90 ℔.....25¢
85 ℔.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating...	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating...	10.50@ 12.00
Worcester Grade, 12 to 14 lbs. coating...	8.00@ 9.00
STP ——— Grade, L 10 to 12 lbs. coating...	7.50@ 8.00
Dean Grade, 8 to 10 lbs. coating...	7.25@ 8.00

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		$7.25
IX, 14 x 28	$10.00	10.25
IXX, 14 x 28	11.50	12.75
IX, 14 x 31	11.50	12.75
IXX, 14 x 31	13.00	14.00

	Per box of 56 sheets.
IX, 14 x 56	$12.50
IXX, 14 x 56	14.00
IX, 14 x 60	13.50
IXX, 14 x 60	15.00

Iron and Steel Sheets—

Black.

	Soft Steel.	Refined Iron.
Nos. 10 to 16...℔ ℔	2.00¢	2.20¢
17 to 20...℔ ℔	2 10¢	2.30¢
21 to 24...℔ ℔	2.20¢	2.40¢
25 and 26.℔ ℔	2.30¢	2.50¢
27.....℔ ℔	2.40¢	2.60¢

Russia, Planished, &c. 100 ℔.

Patent Planished, ℔ ℔, A... $10.20 less 5% dls.
Patent Planished, ℔ ℔, B..... 9.20 less 5% dls.
Craig's Polished Sheet Steel.....8½¢
U.S. Polished Sheet Steel No. 27 A 5.05¢

Galvanized.

First quality.....dls. 80@80&2½%

Copper—*Ingot.*

Lake..... 12¾@13¢
Casting Brands..... 12¼@12½¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17¼c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing, (100 ℔ lots). (To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .36
Plain, ½ inch up to ⅝ inch..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .08
Plain, ¼ inch up to 5-16 inch..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger.....Special.
Plain, smaller than ⅛ inch.....Special.
Bronze and Copper.....8¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.
Small lots .....℔ ℔, 40¢
100-℔ lots.....℔ ℔, 36¢
No 2 (guaranteed over 90% pure).
Small lots.....℔ ℔, 34¢
100-℔ lots .....℔ ℔, 33¢
Nickel Aluminum Casting Metal.
Small lots.....℔ ℔, 39¢
100-℔ lots.....℔ ℔, 35¢
Special Casting Alloy, with over 80% pure Aluminum used in place of brass.
Small lots.....℔ ℔, 35¢
100-℔ lots .....℔ ℔ 30¢
Aluminum Rolled Rods, from ¾ to 1 inch diameter.....℔ ℔, 53¢
Aluminum Drawn Rods, from 1-16 to 1 inch diameter .....℔ ℔, 55¢
Aluminuum Plates and Sheets, B. & S. gauge.

In lots of 50 ℔ or more. Less quantities, 5¢ ℔ ℔ additional.

Wider than	6-in.	14-in.	24-in.
And including.....	14-in.	16-in.	30-in.
	℔ ℔	℔ ℔	℔ ℔
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.40	.45
" 21 to 23.....	.42	.42	.47
" 24.....	.42	.44	.49
" 25.....	.43	.45	.50
" 26.....	.43	.46	.55
" 27.....	.44	.48	.58
" 28.....	.44	.50	.60
" 29.....	.45	.52	.65
" 30.....	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-℔ casks..... 5¾¢
800-℔ casks.....5.95¢
Loose sheets.....6¢

Solder—

Half and Half (50 x 50).....11¢
45/55.....10½¢
Extra Wiping ....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....8¾@9¢
Hallett's.....8¼@8½¢

Lead—

Soft Pig Lead .....4¢
Bar.. .....5¢
Sheet.....6¢

Leader Pipes—

Corrugated.....80&10%

Eave Troughs—

Galvanized.....80&25%
IC Terne.....75&5%
IX Terne.....75&5%
Double Bead GalvanizedLapJoint80&25%
Double Bead GalvanizedSlipJoint80&25%
Double Bead IC Terne Lap Joint..75&5%
Double Bead IX Terne Lap Joint..75&5%

Elbows—

Adjustable Tin.....70%
Spiral.....50&10%
Plain Tin.....70%
Plain Galvanized.....70&5%

Valleys—

Galvanized.....75&5%
IC Terne.....70&15%
IX Terne.....70&15%

Gutters—

Galvanized Roof.....80%
Galvanized Quarter Circle, O. G. and Box.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection.....$2.25 square
Climax..... 2.20 square
The Lloyd Spanish Tiling... 4.50 square
W. J. Burton & Co.'s Roll Cap 3.00 square
Subject to discount.

Metallic Shingles—

Cushman's.....dls. $2.35
Merchant & Co.'s Gothic Shingles.

	10 x 14	14 x 20
IC Tin. .. ℔ square,	$4.75	$4.50
Galv..... ℔ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square
Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square
Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%

Paints, Oils, &c.

Deodorized Benzine.....8 @ 12¢
Iron Paint, Bright Red.....℔ ℔ 2 ¢
" " Brown.....℔ ℔ 1½¢
" " Purple .....℔ ℔ 2½¢
" " Ground in oil, B. Red, ℔ ℔ 6½¢
" " Ground in oil, Red...℔ ℔ 6½¢
" " Ground in oil, Brown, ℔ ℔ 5½¢
" " Ground in oil, Purple, ℔ ℔ 6½¢
Linseed Oil, Boiled, in bbls.....43¢
Linseed Oil, Raw, in bbls.....41¢
Mineral Paints.....1 @ 3¢
Orange Mineral..... .12¢
Pure White Lead in Oil.....5¼ @ 6 ¢
Dry White Lead in bbls.....5 @ 5½¢
Red Lead, American.....5¼ @ 5¾¢
Red, Venetian, English, dry..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans.....8 ¢
kegs, 3 to 6 ¢
Sipe's Japan Oil, in bbls., ℔ gal..... .31¢
Spirits Turpentine, in bbls., ℔ gal....40¢
Asphaltum, Trinidad Refined, ℔ ton.$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.25
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet 90¢
Tarred Felt, 3 Ply, ℔ roll 108 sq. feet..... ... .$1.25
Roofing Pitch, ℔ bbl of 300 ℔.....$3.00

NEW YORK, MARCH 18.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₩ lb, 40¢
100-lb lots.....₩ lb, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₩ lb, 53¢
Aluminum Sheet, B. & S. gauge.
In lots of 50 lbs or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₩ lb	₩ lb.	₩ lb.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.56	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₩ lb extra.

Antimony—

Cookson.....₩ lb, 8½¢
Hallett's.....₩ lb, 7¾@8¢
Japanese.....₩ lb, 7½@7¾¢

Brass—Planished.....net

Roll and Sheet .....30% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.	
¼-in. up to 2-in.	$0.35	30% off.
5/16-in. up to ¾-in.	.36	
⅜-in. up to 5/8-in.	.38	
5/8-in. up to ½ in.	.41	
5-16-in. up to ⅜-in.	.48	
¼-in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3-in. and larger	Special	
2-in. to 3-in., to No. 19, inclusive.	.38	

Copper & Bronze Tubing—

3¢ ₩ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₩ lb 20¢ base
Ingot.
Lake.....13¼¢
Ansonia Grade Casting.....12½¢
Planished.....net
Sheet and Bolt.....16¢ ₩ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe—

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2.00	2.25¢
Nos. 17 to 21	₩ lb, 2.10	2.35¢
Nos. 22 to 24	₩ lb, 2.20	2.45¢
Nos. 25 and 26	₩ lb, 2.30	2.55¢
No. 27	₩ lb, 2.40	2.65¢
No. 28	₩ lb, 2.50	2.75¢

American B. B.....₩ lb, 4¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₩ lb. A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

Nos. 10 to 16	₩ lb, 12¢	50%
Nos. 17 to 21	₩ lb, 13¢	
Nos. 22 to 24	₩ lb, 14¢	
Nos. 25 to 26	₩ lb, 15¢	
No. 27	₩ lb, 16¢	
No. 28	₩ lb, 17¢	
No. 29	₩ lb, 19¢	
No. 30	₩ lb, 21¢	

36 in. 1¢ ₩ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4½@4¾¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....38¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb..... 6 ¢
Lead, Amn. White, in oil..... 6 ¢
Lead, Red, bbls. and ¼ bbls..... 6 ¢
Lead, Red, kegs..... 6 ¢
Ochre, American..... 1½¢
Red Venetian, American..... 1¾¢
Linseed Oil:
Raw, ₩ gal.....43@44¢
Boiled.....45@46¢
Spirits Turpentine:
In bbls.....37¢
In cases.....45¢
Putty:
In barrels and ⅛ bbls..... 1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₩ lb 5¼¢
Clarified.....₩ lb 5 ¢
Accra.....₩ lb 4¾¢
Half Jack.....₩ lb 4½¢
Cecilia.....₩ 100 lb $4.85
Choice Red.....₩ 100 lb 4.60
(*Spot Oil*, ⅛c. ₩ lb *higher.*)

Petroleum Products—

In Barrels (Barrel Included).
Stove Gasoline.....₩ gal. 10@11¢
Kerosene.....₩ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896.

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....75%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks 70@10%
Soldering Unions.....70%
" Nipples.....70@75%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves.70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.
Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₩ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....40&10%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....70&5%
Galvanized Iron Range Boilers above 52 gallon.....60%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gal..65&5%
Galvanizen Iron Range Boilers, Extra Heavy, above 52 gallon.....50&5%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....60%
" " " Backs Plain.....60%
" " " " Galvanized....60%
" " " Legs Plain.....60%
" " " " Galvanized....60%
" " " Backs with air chambers, Plain.....60%
Cast Iron Sinks, Backs with air chambers Galvanized.....60%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.
Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40&10%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	48½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 ply, ₩ lb.....2¢
2 Ply Roofing, ₩ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₩ roll, 108 sq. ft..... 1.85
Roofing Pitch, ₩ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.	₩ bbl.	$1.48@	$1.49
Rosin, E. & F.	₩ bbl.	1.55@	1.60
Rosin, G. & H.	₩ bbl.	1.70@	1.80
Rosin, I. & K.	₩ bbl.	1.85@	1.90
Rosin, M. & N.	₩ bbl.	2.10@	2.20

Seamless Brass Tubes—

Net List, Feb. 1, 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₩ sqr.	$3.50@	$4.50
No. 1 Bangor Ribbon	3.00@	3.25
Pen Argyle, ₩ sqr.	3.25@	3.50
Peach Bottom, ₩ sqr.	4.75@	5.60
No. 1 Chapman, ₩ sqr.	3.00@	4.25
Lehigh Slates, ₩ sqr.	3.25@	3.80

Vermont:

Sea Green, ₩ sqr.	$2.45@	$3.05
Purple, ₩ sqr.	3.75@	4.00
Variegated Purple	2.25@	2.90
Unfading Green, ₩ sqr.	3.50@	4.00
Red, ₩ sqr.	8.50@	10.50

Solder and Soldering Fluids—

Solder—

⅛&¼ guaranteed..... 10½@10¾¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs about 55 lb, ₩ lb.....4¢
5% dis.

Yager's Soldering Salts.
½ lb bottles, each.....30¢
Large quantities, ₩ lb.....40¢

Soldering Coppers—

Per lb.....16¢@17¢ net

Spelter—

Western Spelter..... 4.65@4¾
Bertha (pure).....7@7½

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₩ lb.....15½¢
Straits, pigs, lb lb.....14¾@15½¢
Straits, in bars, ₩ lb.....16¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Caliand or Melyn Grade,	IC,	10 x 14 / 14 x 20	..	$4.75
" "	IX,	10 x 14 / 14 x 20	..	5.75
" "	IXX,	14 x 20	....	6.75
" "	IXXX,	14 x 20	....	7.75
" "	IXXXX,	14 x 20	....	8.75
" "	DC,	12½ x 17	....	4.25
" "	DX,	12½ x 17	....	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	.	4.25
" "	IX,	10 x 14 / 14 x 20	.	5.00
" "	IXX,	14 x 20	...	5.75
" "	IXXX,	14 x 20	...	6.50
" "	IXXXX,	14 x 20	...	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	..	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	..	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	10¢
95 lb	15¢
90 lb	20¢
85 lb	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating.....	8.00 @ 9.25
STP Grade, 10 to 12 lb coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets)..... $9.10
IXX, 14 x 28..(112 sheets)..... 9.80
IXX, 14 x 31..(112 sheets)..... 10.85

Tin Plates, Imported—

Duty, 1⅛¢ ₩ lb.

Charcoal Plates, Bright—

Melyn and Caliland Grade,	IC,	14 x 20.....	$5.00
" "	IX,	14 x 20.....	6.00
Allaway Grade,	IC,	14 x 20.....	4.25
" "	IX,	14 x 20.....	5.00

Coke Plates, Bright—

Steel Coke,	IC, 14 x 20.....	$4.25
	IX, 14 x 20.....	5.25

Terne Plates—

Worcester Grade,	IC, 14 x 20.....	4.25
	20 x 28.....	8.50
Dean Grade,	IC, 14 x 20.....	4.00
	20 x 28.....	8.00
Gilbertson's Old Method,	IC, 14 x 20..	7.50
	20 x 28..	15.00

Troughs, Eave—See *Eave Trough.*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₩ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 189 .

1¼ and less, Plain	57&10&10&10%
1¼ and less, Galv.	50&10&10&10%
1½ and larger, Plain	67&10&10&10%
1½ and larger, Galv	55&10&10&10%
Screw and Socket Joint Casing	65%
Inserted Joint Casing	60%
Boiler Tubes, 2¼ inch and smaller.	72½%
" 2½ inch and larger	75%

Zinc—

600 lb casks ₩ lb 5¾¢ | Per lb..... 6¼¢

ALPHABETICAL LIST OF ADVERTISERS.

Acme Machine Co..... 71
Adriance Machine Works... 75
Ætna-Standard Iron & Steel Co..... 66
American Corrugating Co.. 68
Apollo Iron & Steel Co.. 1
Armstrong Mfg. Co..... 21
Atlanta Steel & Tin Plate Co. 66
Baker, J. R. Co.... 63
Bangor Excelsior Slate Co... 58
Barstow Stove Co..... 76
Beaver Tin Plate Co..... 65
Beckwith, P. D., Estate of.. 2
Bell, Jno. W. & Co..... 63
Berger Bros. Co 64
Berger, L. D..... 63
Bergstrom Bros. & Co. 12
Bertsch & Co..... 74
Bibb, B. C. Stove Co..... 16
Bliss, E. W. Co..... 74
Bowen Mfg. Co..... 25
Bowers, L. M. & Co..... 63
Brand Stove Co 13
Brauer, A. G..... 62
Bray, J. & Co..... 70
Brombacher's Sons, Jacob... 72
Bruce & Cook .....67&76
Buckeye Dish Washer Co.... 25
Burton, W. J. & Co..... 67
Cambridge Roofing Co..... 68
Canton Steel Roofing Co..... 68
Carton Furnace Co..... 3
Challenge Corn Planter Co.. 24
Champion Steel Range Co... 17
Chautauqua Hanger Co.... 63
Cheney, S. & Son..... 1
Cincinnati Corrugating Co.. 69
Cincinnati Stamping Co..... 69
Clough, R. M..... 74
Coe, Jas. A. & Co..... 65
Colt, J. B. & Co..... 16
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Wheeler, Russel & Son, Utica, N. Y.

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Hill, Whitney & Wood Co., Boston, Mass.
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I. X. L. Beer Pump Co., Phila., Pa.

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Wolff, L. Mfg. Co., Chicago, Ill.

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Hussey, C. G. & Co., Pittsburgh, Pa.

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Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.

Building Paper.
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Bliss, E. W. Co., Brooklyn, N. Y.
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Niagara Machine & Tool Wks, Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.

Castings.
Chency, S. & Son, Manlius, N. Y.
Forest City Fdry. & Mfg. Co., Cleveland, Ohio.

Ceilings, Metallic.
American Corrugating Co, St. Louis, Mo.
Cambridge Roofing Co., Cambridge, O
Canton Steel Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Northrop, H. S., 40 Cherry St., N. Y.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Cocks, Ball, Basin and Stop.
Landers, Frary & Clark, New Britain, Conn.
Peck, Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coffee Pots.
Hill, Whitney & Wood Co., Boston, Mass.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros. Co., Philadelphia, Pa
Bowers, L. M. & Co., Binghamton, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Marlin & Co., Pittsburgh, Pa.

Conductor Pipe Machinery.
Universal Machine Co., Canton, Ohio.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.
Hussey, C. G. & Co., Pittsburgh, Pa.

Copper Bottoms.
Hussey, C. G. & Co., Pittsburgh, Pa.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. O. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. *(See Pipe Couplers.)*

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Johns H. W. Mfg. Co, 100 William St., N. Y.

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Rochester Stamping Works, Rochester, N. Y.

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Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, Ohio.

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Berger Bros. Co., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co, Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Dish Washers.
Buckeye Dish Washer Co., Toledo, O.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dumb Waiters.
Energy Mfg. Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Bowers, L. M & Co., Binghamton, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Hangers.
Baker, J. R. & Sons Co, Kendallville, Ind
Bell, Jno. W. & Co., Mercer, Pa.
Chautauqua Hanger Co., Mayville, N. Y.

Eave Trough Machinery.
Universal Machine Co., Canton, Ohio.

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Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

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Eddy Electric Mfg. Co, Windsor, Conn.

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Eddy Electric Mfg. Co., Windsor, Coun.

Electric Motors.
Eddy Electric Mfg. Co., Windsor, Conn.

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Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

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Koven, L. O. & Bro., 18 Spruce St., N. Y.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Felt.
Johns, H. W. Mfg Co., 100 William St., N. Y.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Hart & Crouse Co., Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Pease, J. F., F'ce Co., Syracuse, N. Y.
Peck, Williamson Heating & Ventilating Co., Cincinnati, O.
Richmond Stove Co., Norwich, Ct.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N. Y.
Tubular Heating & Ventilating Co., Phila., Pa.
Wheeler, Russel & Son, Utica, N. Y.

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Hull, M. L., Cleveland, O.

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Keen & Hagerty Mfg. Co., Baltimore, Md.

Gas Heaters. *(See Stoves and Ranges, Gas.)*

Gas Machines.
Colt, J. B. & Co., 115-117 Nassau St., N. Y.
Kent, C. M. Mfg. Co., Baltimore, Md.

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St. Louis Stamping Co., St. Louis, Mo.

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Jackson, W. Sons, 246 Front St., N. Y.

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Whelan, Dennis, J., Troy, N. Y.

Hammocks.
Palmer, I. E., Middletown, Ct.

Heat Regulators.
Howard Thermostat Co., Oswego, N. Y.
Pease, J. F., Furnace Co., Syracuse, N. Y.

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Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Drake, W. H., Newark, N. J.
Empire Heating Co., Easton, Pa.
Excelsior Steel Furnace Co., Chicago, Ill.
Gorton & Lidgerwood Co., 93 Liberty St., New York.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
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Mowry, W. C., Norwich, Conn.
National Pipe Bending Co., New Haven, Conn.
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Putnam Foundry & Machine Co., Putnam, Conn.
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Griswold Mfg. Co., Erie, Pa.
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Lalance & Grosjean Mfg. Co., 19 Cliff St., New York.
St. Louis Stamping Co., St. Louis, Mo.
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Illinois Pure Aluminum Co., Lemont, Ill.

House Furnishing Supplies.
Dover Stamping Co., Boston, Mass.
Parks & Parks, Troy, N. Y.

Iron, Galvanized Sheet. *(See Sheets, Galvanized.)*

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Wood, W. D. Co., McKeesport, Pa.

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Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Kitchen Specialties.
Dover Stamping Co., Boston, Mass.

Lath Metallic.
American Corrugating Co., St. Louis, Mo.
Schratwiesers Metal Lath Works.

Lavatories.
Wheeler, E. S. & Co., New Haven, Ct.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Lightning Rods.
Washburne, E. G. & Co., 46 Cortlandt St., N. Y.

Metal Ceilings. *(See Ceilings, Metallic.)*

Mica.
Munsell, Eugene & Co., 218 Water St., New York.

Milk Cans.
Kleckhefer Bros. Co., Milwaukee, Wis.
Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.

Molding Frames.
Acme Machine Co., Cincinnati, O.

Nickel Plating Outfits.
Eddy Electric Mfg Co., Windsor, Conn.
Upham, Ely C., 35 Dey St., N. Y.

Oil Heaters. *(See Stoves and Ranges, Oil, Vapor and Gasoline.)*

Ovens, Portable.
Franke, H, Cleveland, Ohio.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
Stocking, E. B., Washington, D. C.

Patterns.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

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Dixon, Jos. Crucible Co., Jersey City, N. J.

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Millar, C. & Son, Utica, N. Y.

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Crawford & Young, Boston, Mass.
Kelly, Thos. & Bros., Chicago, Ill.
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National Pipe Bending Co., New Haven, Conn.
Peck Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.
Tinners' Machinery & Supply Co., 26 Cliff St., New York.
Vanderman Plumbing & Heating Co., Willimantic, Conn.
Wheeler, E. S. & Co., New Haven, Ct.
Wilson, R. M. Mfg. Co., Rome, N. Y.
Wolff, L. Mfg. Co., Chicago, Ill.

Pokers and Lifters.
Troy Nickel Works, Troy, N. Y.

Potato Masher.
Vogel, Wm. & Bros., 37 to 47 S. 9th St., Brooklyn, N. Y.

Presses and Dies.
Adrlance Mach. Works, Brooklyn, N. Y.
Bliss, E. W. Co., Brooklyn, N. Y.
Ferracute Machine Co., Bridgeton, N. J.
Gordon, W. J., Philadelphia, Pa.
Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N. Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Swaine, Fred. J., St. Louis, Mo.
West Mfg. Co., Buffalo, N. Y.

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Russler, H. B., Johnstown, O.

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Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Robinson, J. M. & Co., Cincinnati, O.

Radiators, Oil.
Dangler Stove & Mfg. Co, Cincinnati, Ohio.

Radiators, Steam and Hot Water.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Smith, H. B. Co., 135 Centre St., N. Y.

Range Boilers.
Koven, L. O. & Bro., 18 Spruce St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl St., New York.

Refrigerators.
Bowen Mfg. Co., Fond du Lac, Wis.
Challenge Corn Planter Co., Grand Haven, Mich.
Gurney Refrigerator Co., Fond du Lac, Wis.

Registers.
Excelsior Steel Furnace Co., Chicago, Ill.
Ferrosteel Co, Cleveland, O.
Highton, Wm. & Sons, Boston, Mass.

Roofing, Asphalt.
Perkins, J. L. & Co., Chicago, Ill.

Roofing, Terne.
Atlanta Steel & Tin Plate Co., Atlanta, Ind.

Roofing Cement and Paint.
Connors, Wm., Troy, N. Y.
Dixon, Jos. Crucible Co., Jersey City, N. J.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
Perkins, J. L. & Co., Chicago, Ill.

Roofing and Siding, Iron and Steel, Corrugated and Plain.
American Corrugating Co., St. Louis, Mo.
Bowers, L. M. & Co, Binghamton, N. Y.
Burton, W. J. & Co., Detroit, Mich.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J
Phila. Steel Roofing Co., Phila., Pa.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Seamers.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Roofing Slate.
Bangor Excelsior Slate Co., Bangor, Pa.
Bray, J. & Co, E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.

Sad Irons.
Ferrosteel Co., Cleveland, O.

Sap Spouts.
Millar, C. & Son, Utica, N. Y.

Schools and Colleges.
International Correspondence Schools, Scranton, Pa.

Scrap Metals.
Detroit Smelting and Refining Works, Detroit, Mich.

Sheet Metal Machinery.
Acme Machine Co., Cincinnati, O.
Adrlance Mach. Works, Brooklyn, N. Y.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. O. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Poorman Mfg. Co., Piqua, Ohio.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co. Brooklyn, N. Y.
Universal Machine Co., Canton, Ohio.
West Mfg. Co., Buffalo, N. Y.
Whelan, Dennis J., Troy, N Y.

Sheets, Iron and Steel.

Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Sheets, Galvanized.

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn. Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood Alan Co., Philadelphia, Pa.

Shingles and Tiles, Metallic.

Burden, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O.
Cortright Metal Roofing Co., Philadelphia, Pa.
Iron City Mfg. Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Montross Metal Shingle Co., Camden, N. J.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

Siding. (*See Roofing and Siding.*)

Slate Dresser.

Marks, F. R., Ashland, O.

Slaters Tools.

Galt, Jno. & Sons, 253 Broadway, N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Slitting Shears.

Whelan, Dennis J., Troy, N. Y.

Snow Guards.

Hallilday, M., East 9th St., N. Y.

Solder.

Bruce & Cook, 186 to 190 Water St., N.Y.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Sanborn, J., 217 Water St., N. Y.
Taylor, N. & G. Co., Philadelphia, Pa.

Soldering Furnaces.

Hull, M. L., Cleveland, O.

Speaking Tubes and Whistles.

Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Specialties, Sheet Metal.

Vogel, Wm. & Bros., Brooklyn, N. Y.

Stamped Ware, Aluminum.

Illinois Pure Aluminum Co., Lemont, Ill.

Steam and Gas Fitters' Supplies.

Curtis & Curtis, Bridgeport, Conn.
Kleley, T., 7-11 West 13th St., N. Y.

Steel Stamps and Stencil Dies.

Schwerdtle & Siebert, Bridgeport, Ct.

Stove Linings.

Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.
Williams Stove Lining Co., Taunton, Mass.

Stove and Metal Polish.

Hoffman, Geo. W., Indianapolis, Ind.

Stove Patterns.

Cope, G. W., Detroit, Mich.
Gobellie Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros. Co., Phila., Pa.
Marlin & Co., Pittsburgh, Pa.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.

Parks & Parks, Troy, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St. N. Y.
Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.

Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

Stoves and Ranges.

Beckwith, P. D., Est. of, Dowaglac, Mich.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Champion Steel Range Co., Cleveland, Ohio.
Globe Steel Range Co., Kokomo, Ind.
Magee Furnace Co., Boston, Mass
Portsmouth Stove & Range Co., Portsmouth, O.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Sheppard, Isaac A. & Co., Phila., Pa.
Weir Stove Co., Taunton, Mass.
White-Warner Co., Taunton, Mass.

Stoves and Ranges, Gas.

Griswold Mfg. Co., Erie, Pa.
Ringen Stove Co., St. Louis, Mo.

Stoves and Ranges, Oil, Vapor and Gasoline.

Barstow Stove Co., Providence, R. I.
Dangler Stove & Mfg. Co., Cleveland, O.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.

Tea Kettles.

Hill-Whitney & Wood Co., Boston, Mass.
Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

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Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
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Stiles & Parker Press Co., Brooklyn, N. Y.
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Vogel, Wm. & Bros. Brooklyn, N. Y.

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Atlanta Steel & Tin Plate Co., Atlanta, Ind.
Beaver Tin Plate Co., Lisbon, Ohio.
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A good TINNER; one who has a good knowledge of plumbing preferred. Lock Box 36, Willoughby, Ohio. March 19

Thoroughly competent SUPERINTENDENT for factory making plain lacquered and lithographed tin boxes and packages; must be a good executive; liberal salary and interest in the profits to the right man. Address stating age, experience and reference; all communications will be treated strictly confidential. "Tin Boxes," office of *The Metal Worker*, 232-238 William street, New York City. March 19

First-class PLUMBER for best town in Florida; must be able to estimate. Apply, giving all partiulars, to "Florida," office of *The Metal Worker*, 232-238 William street, New York City. March 19

A first-class experienced stove SALESMAN to sell a leading trade-mark line in Illinois; address in confidence with full particulars as to past experience, sales, salary, age, &c., "First-Class," office of *The Metal Worker*, 232-238 William street, New York City. March 19

A young man to take charge of shop where lithographed tin boxes are made up. P. O. Box 348, Montreal, Quebec, Canada. March 19

A good all around TIN and SHEET IRON WORKER; must understand iron piping and have some knowledge of plumbing; be able to clerk in hardware store; be sober and reliable; a steady job for the right man; state age and wages expected. "Hardware," Box 12, Luzerne, N. Y. March 19

First-class CORNICE MAKERS and TIN ROOFERS. Currie Hardware Company, 1216-1218 Atlantic avenue, Atlantic City, N. J. March 12

A man with good executive ability, who has had experience in a large stamped ware factory, where tin and steel ware for enameling are made, and a large number of hands are employed; one accustomed to supervising the making of machinery and dies, and capable of superintending; must be temperate; state age, experience, salary; applications will be treated as confidential. Address "Stamped Ware," office of *The Metal Worker*, 232-238 William street, New York City. March 12

A TINSMITH on assortment work in tin factory; to board with employer; a Catholic sober, single young man with some knowledge of plumbing. M. Mond, Ozone Park, L. I., N. Y. March 12

Experienced HOLLOW WARE MOLDER, as assistant foreman; also PATTERN MAKER in steel. "Hollow," office of *The Metal Worker*, 232-238 William street, New York City. March 12

A good reliable man capable at first-class work at either tinning or plumbing; married man preferred; steady job. Box 23 Aurora, N. Y. March 12

SITUATIONS WANTED.

By an up to date wrought steel RANGE MAKER; 16 years' experience at steel cooking apparatus; has all bench tools. "Wm. R. B.," 320 Fort street, W., Detroit, Mich. March 19

By a young man 28 years of age, who has had 14 years' experience at pipe fitting, steam, hot water and gas; good general hand at steam, hot air and water pumps and repairing. "H. E. S.," 66 Cliff street, New York City. March 19

As FOREMAN and CUTTER in a cornice and skylight shop, by a sober and industrious mechanic of 20 years' experience; competent in all branches. "J. H B.," 122 Ralph street, Brooklyn, N. Y. March 19

TINSMITH, first-class workman, would like a steady job; experienced at roofing, spouting, stove, range and good furnace worker; also tinware, pump and common plumbing; 18 years' experience, 34 years old, single, and steady habits; wages moderate. Chas. C. Stites, Port Jefferson, N. Y. March 19

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TINSMITH, an all around mechanic; can do any work coming to a general job shop; steam, hot water and hot air; can make estimates; thoroughly sober and industrious; middle-aged, unmarried, excellent reference; will make reasonable arrangements for immediate engagement; country preferred. "Mechanic," care Chas. C. Proffett, 38 Bleecker street, New York City. March 19

As inside or outside CORNICE WORKER or as ASSISTANT CUTTER; good reference; state wages "C.," 328 East Chestnut street, Lancaster, Pa. March 19

As FOREMAN or CUTTER in a large cornice and skylight shop; I am thorough in all branches of the business; good draftsman; can estimate and handle men to best advantage; strictly sober. "Foreman," office of *The Metal Worker*, 22-24 Pickering Building, Cincinnati, Ohio. March 19

As TIN ROOFER and GENERAL JOBBER, by a young man 29 years of age, willing to work for $9 per week; country preferred. J. L. Watrous, Mills Hotel, Bleecker street, New York City. March 19

By a good steady CORNICE MAKER; can take charge of shop or outside work if required. "Cornice Maker," 132 South Green street, Chicago, Ill. March 19

By an all around TINSMITH at inside and outside work; furnace and iron pipe worker; 14 years' experience; first class reference For particulars. P. O. Box 237, Marlboro, Ulster County, N. Y. March 19

By a PLUMBER, STEAM and GAS FITTER; a practical mechanic; first-class references; will board with employer. James Scanlan, 552 Ninth avenue, New York City. March 19

First-class PLUMBER, GAS FITTER and ROOFER; understands city and country work; new work and general jobbing; have reference and journeyman's license; city or country; wages $2. A. Yack, 718 Second avenue, New York City. March 19

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By a first-class PLUMBER and GA FITTER, who understands steam fitting; can estimate and figure from plans; country preferred; references. "J. P.," care Wm. Barry, 347 East Seventy-eighth street, New York City. March 19

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As TRAVELING SALESMAN by party with over eight years' experience in the metal ceiling, roofing and conductor pipe business; can furnish satisfactory references. Address "Salesman," office of *The Metal Worker*, 232-238 William street, New York City. March 19

By a young man (single) as CLERK in a hardware store; inexperienced, but willing to start on small salary with chance of advancement; can furnish good recommendation and understands the principles of bookkeeping. C H. Upton, Green Springs, Ohio. March 19

By PLUMBER and FITTER, with a good knowledge of tinsmithing; A1 man; can furnish best of reference. "Reliable," 104 West 134th street, New York City. March 19

By a young man, as all around jobber; gas fitting, roofing, plumbing, leader work, &c.; good reference; has been in city and country shops; a country shop preferred. "Plumber," 253 West Twenty-fourth street, New York City. March 19

By a first-class PLUMBER in city or country; 12 years' experience; wages moderate. John Shea, 1331 Third avenue, New York City. March 19

By a first-class PLUMBER and GAS FITTER; a fine lead worker; 12 years' experience; has worked in best shops in city and country. "C. F. R.," 1610 Second avenue, New York City. March 19

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A young man with six years' experience in the hardware and mill supply business is desirous of making a change. "B. B.," office of *The Metal Worker*, 232-238 William street, New York City. March 19

First-class CORNICE MAKER; competent to do nearly all intricate cornice cutting; would like position at small wages to finish learning detail drafting; willing to work at the bench and outside if desired; American; industrious and strictly sober; correspondence solicited from any good shop in the United States. "Cornice Maker," office of *The Metal Worker*, 232-238 William street, New York City. March 19

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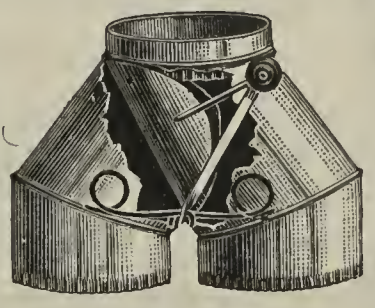
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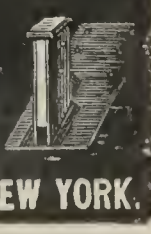
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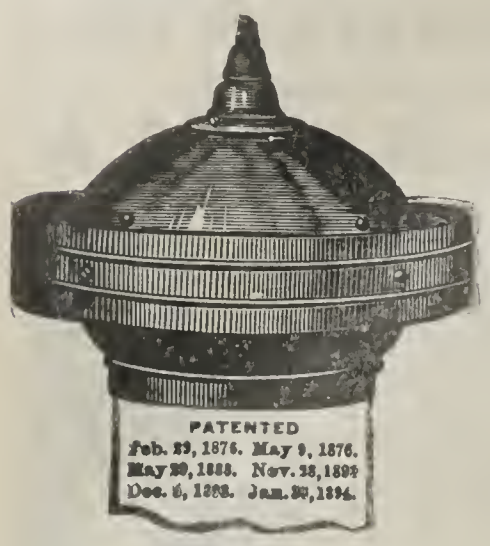


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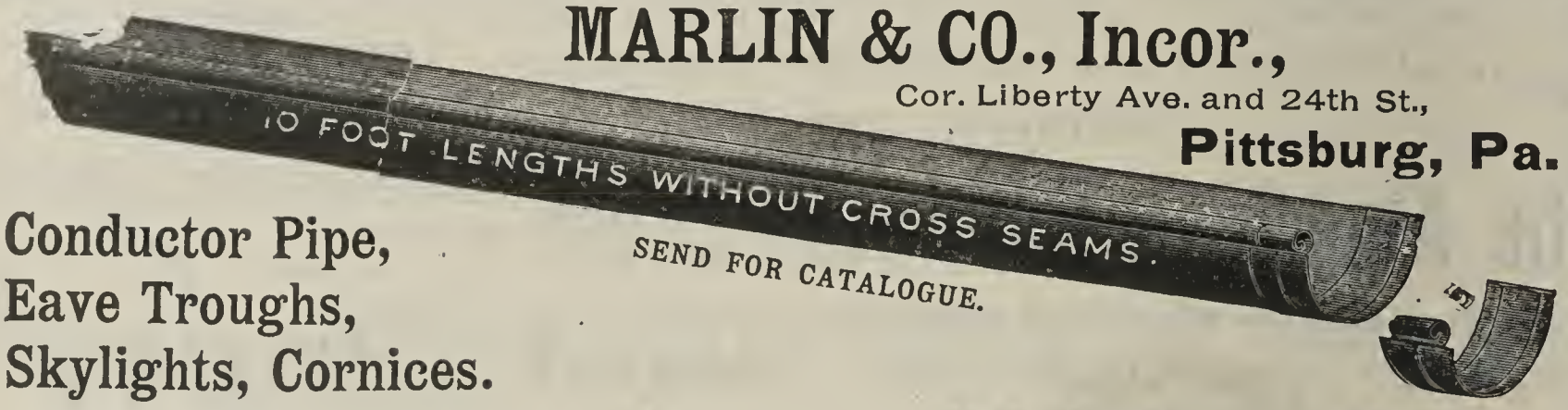
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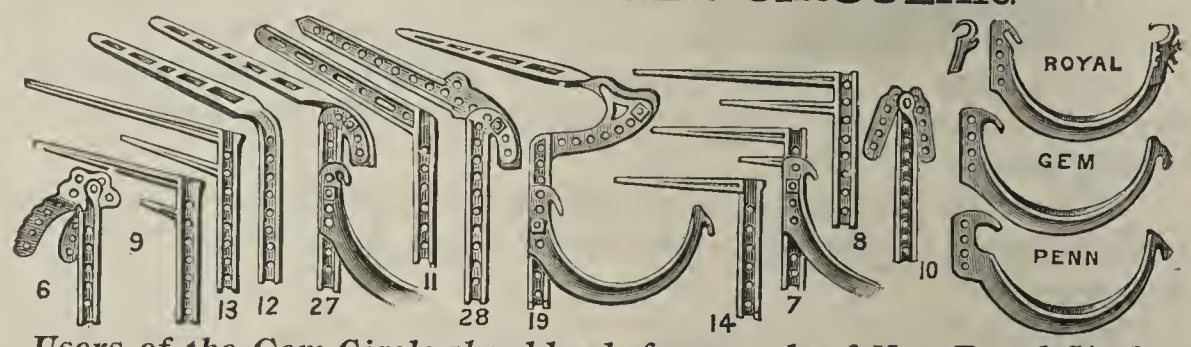




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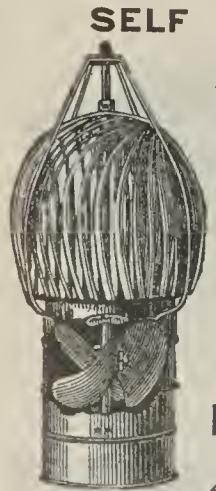
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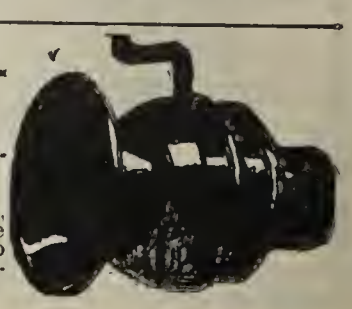
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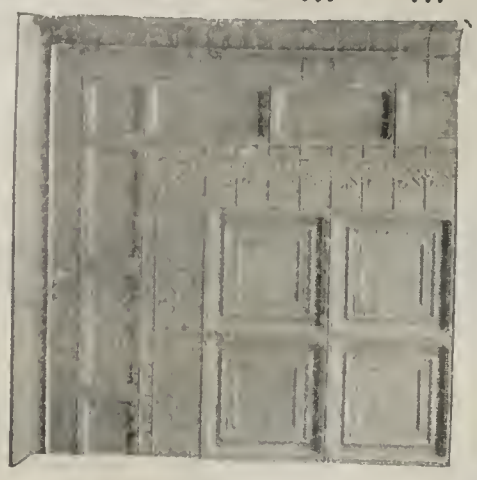
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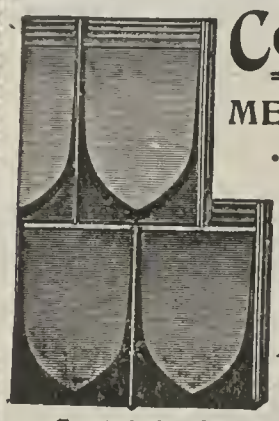
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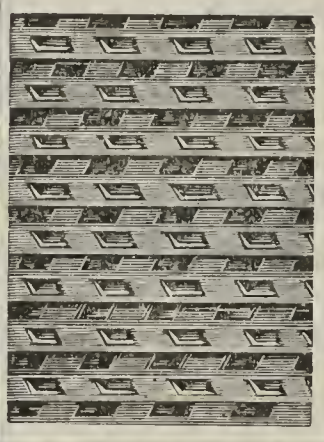
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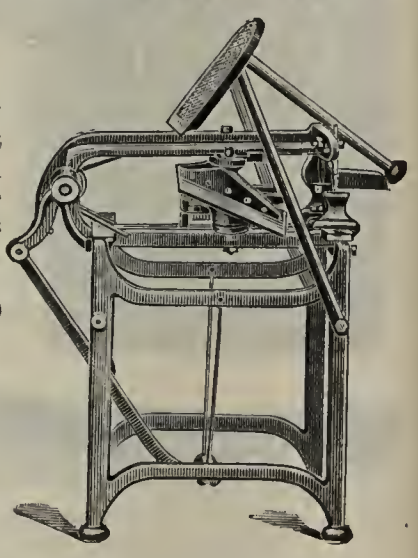
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Rolls are made of best quality of steel, heavy and well supported.

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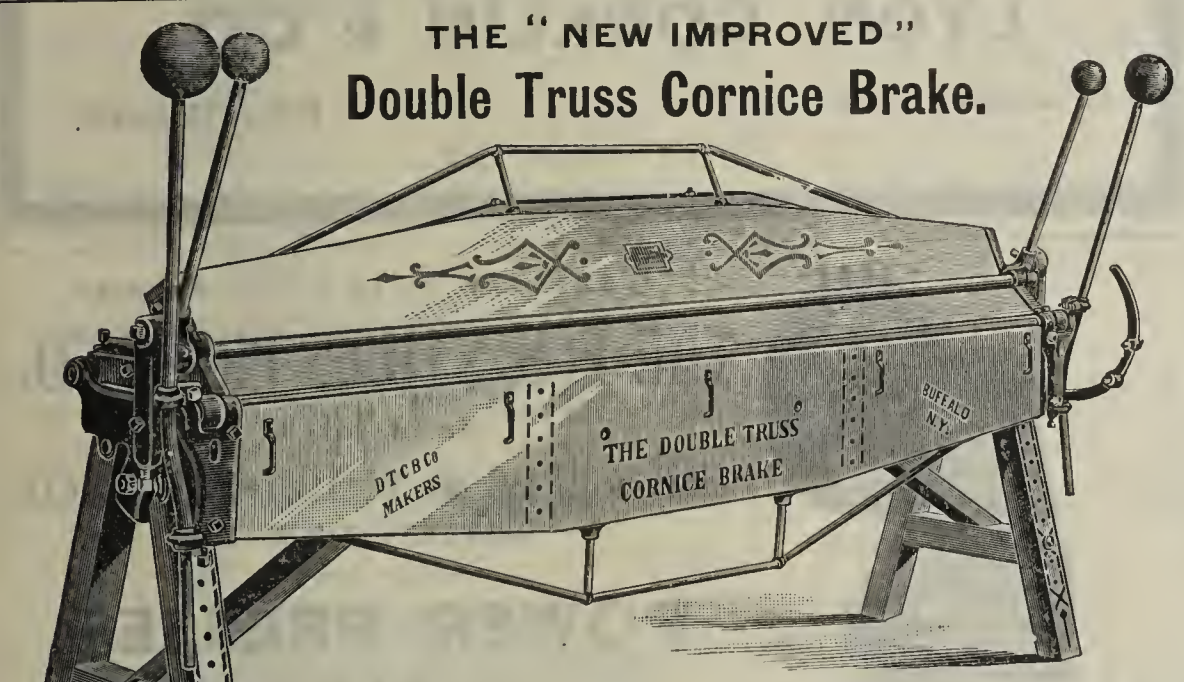
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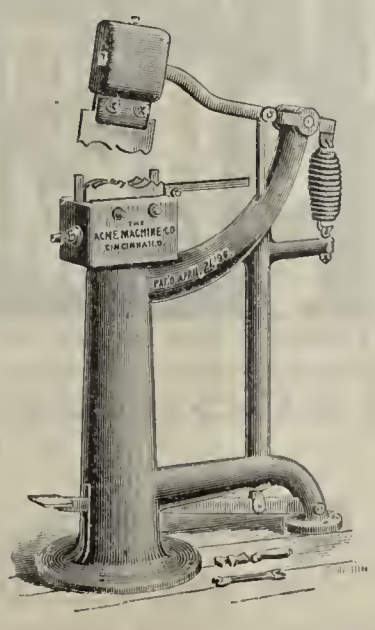
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—WANTED TO UNDERSTAND.—At a clinic of nervous diseases in a certain medical college of Chicago Professor B., an irritable man, was conducting. The exercises were nearly finished when an assistant brought in word of a peculiarly interesting patient who had just arrived. The attendant was eager to have the new case exhibited.

"Well, be quick about it," said the doctor, who proceeded to emphasize some previous remarks concerning the influence of occupation upon nervous conditions, which point he proposed to illustrate in the case to be presented.

The patient, an awkward Swede, having been hustled into a chair, was now confronted by Professor B., with the admonition to be brief and accurate in his replies, as time was limited.

"Now, sir, what do you do?" he began.

"Aw am not vera well."

"No! I say, what do you do?"

"Oh, yas. Aw verk."

"Yes, I know; but what kind of work?"

"Oh, eet es hard verk."

"Yes; but do you shovel" (illustrating with gesture), "or drive a car, or work at a machine, or do——"

"Oh, yas. Aw verk at a masheen."

"Ah! What kind of machine?"

"Oh, et ees a big masheen."

By this time the students were grinning broadly and whispering pleasantries, all of which caused the professor to redden and break into a volley at the poor Swede.

"Now look here, sir, I want no more of this! You answer the questions I ask you, or go home. What do you make on this machine?"

A ray of intelligence lit up the face of the Swede, and with a confident smile, he said. "Oh, now Aw understan' yo'. Yo' vant to know vat Aw mak' on the masheen. Eesn't et?"

"Yes, sir; that is it. What do you make?"

"Aw mak' 17 cents an hour," and he and the class were dismissed.

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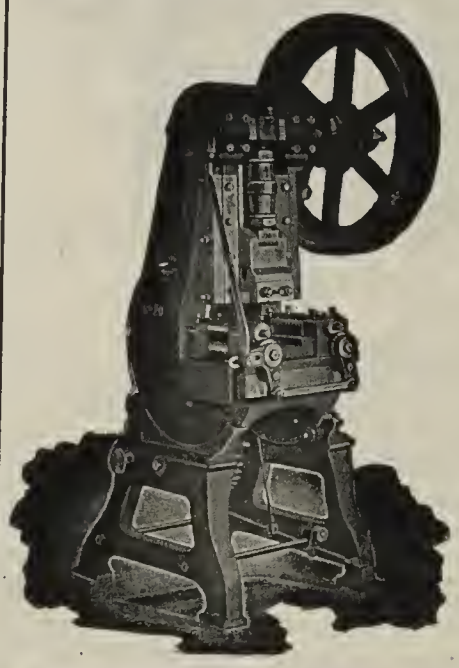
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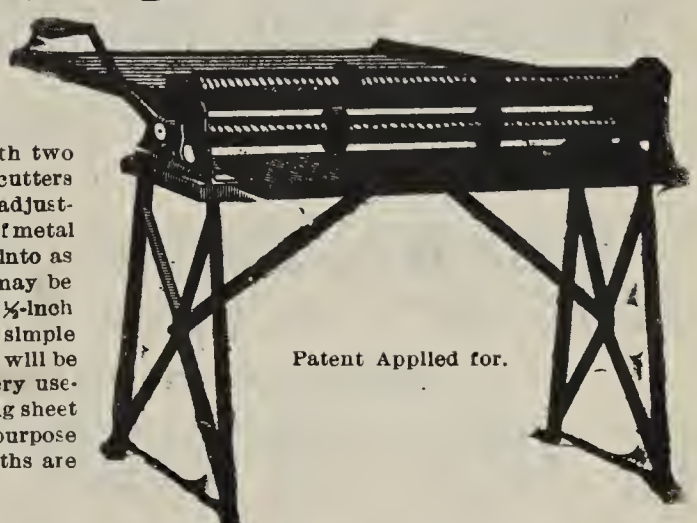
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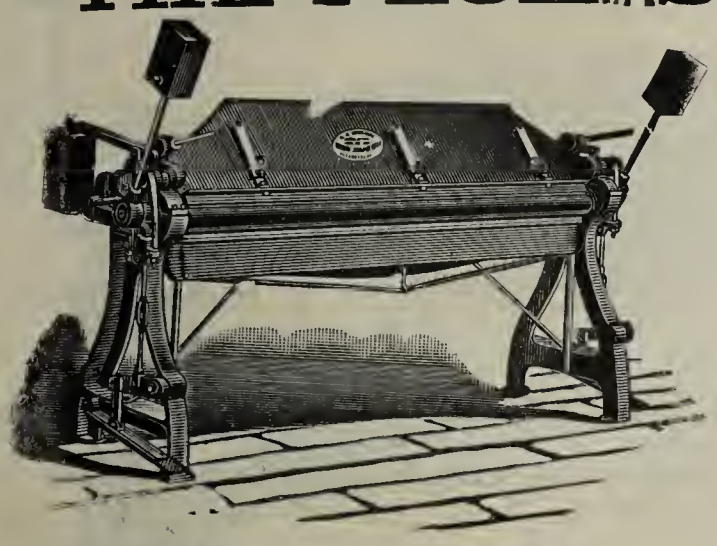
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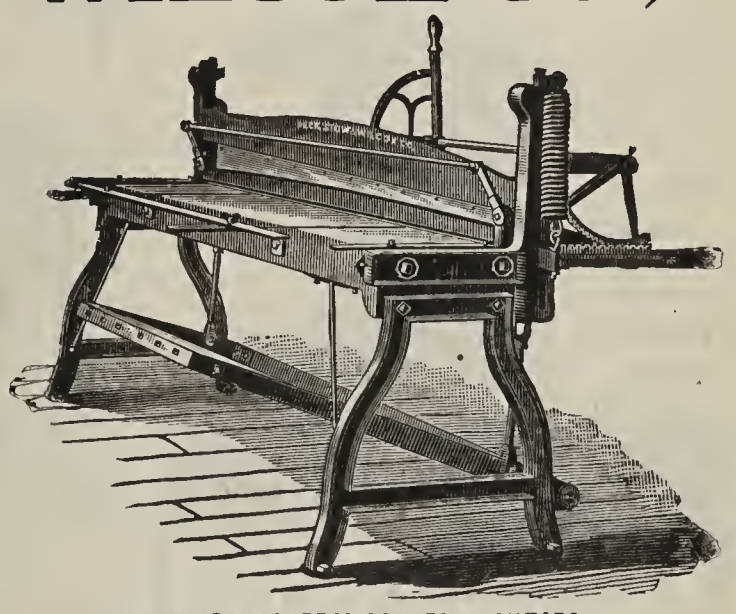
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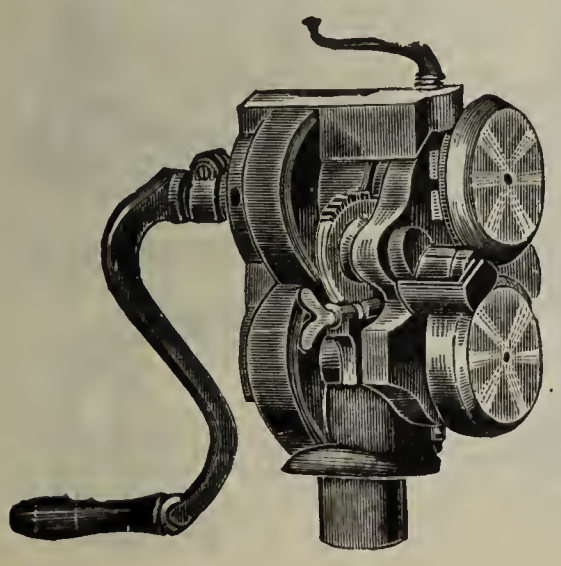
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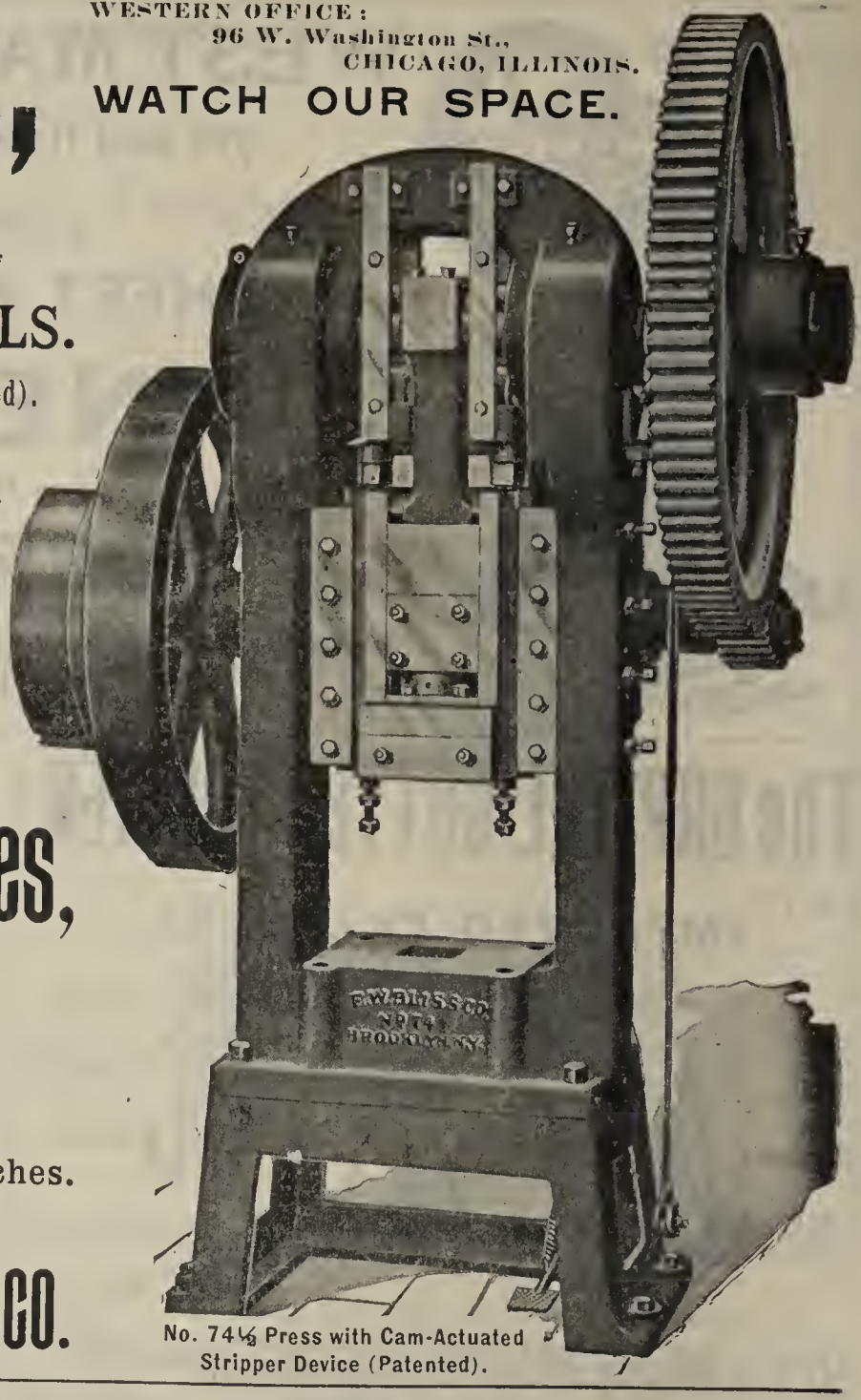
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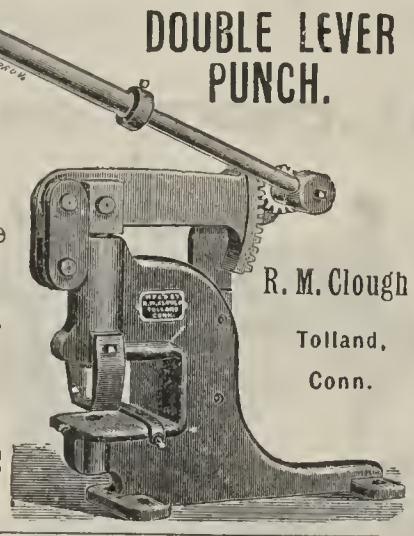
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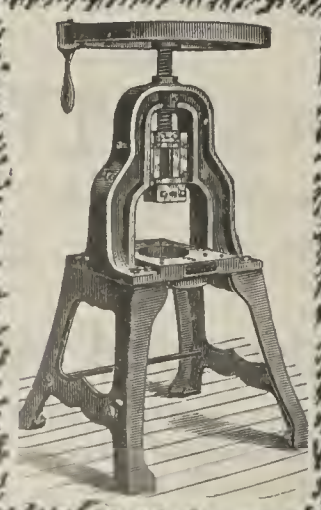
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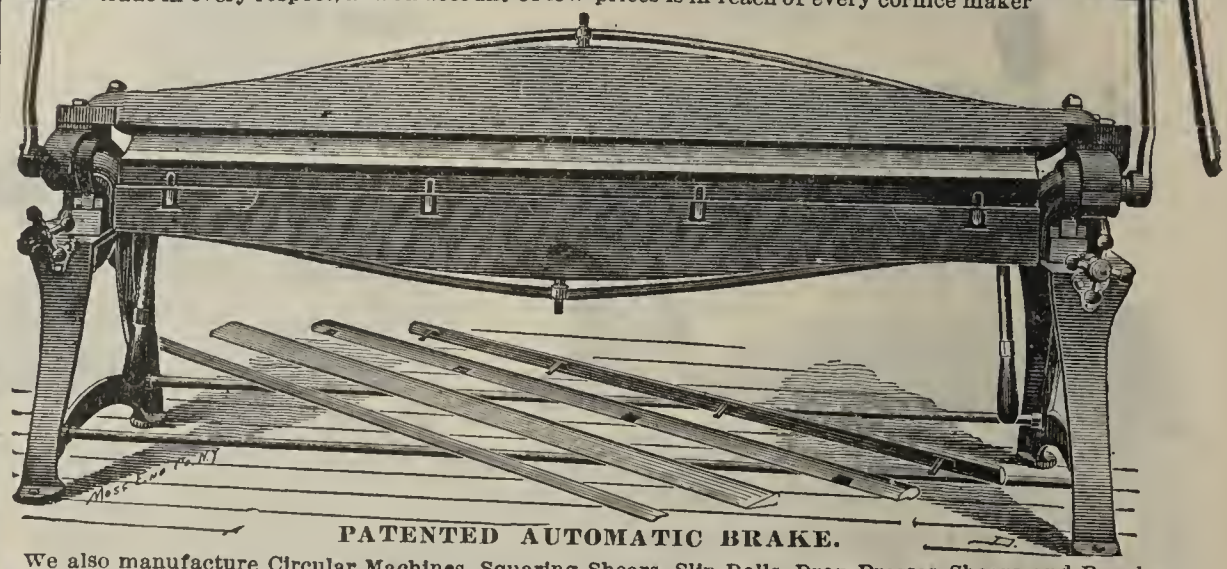
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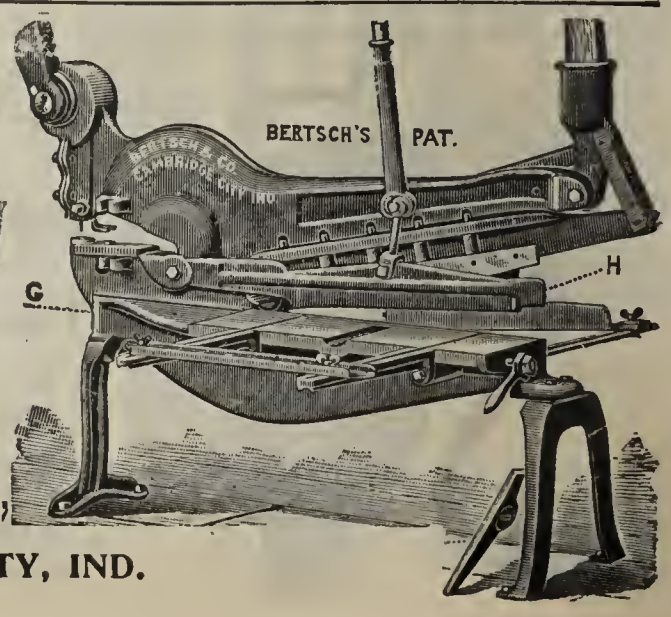
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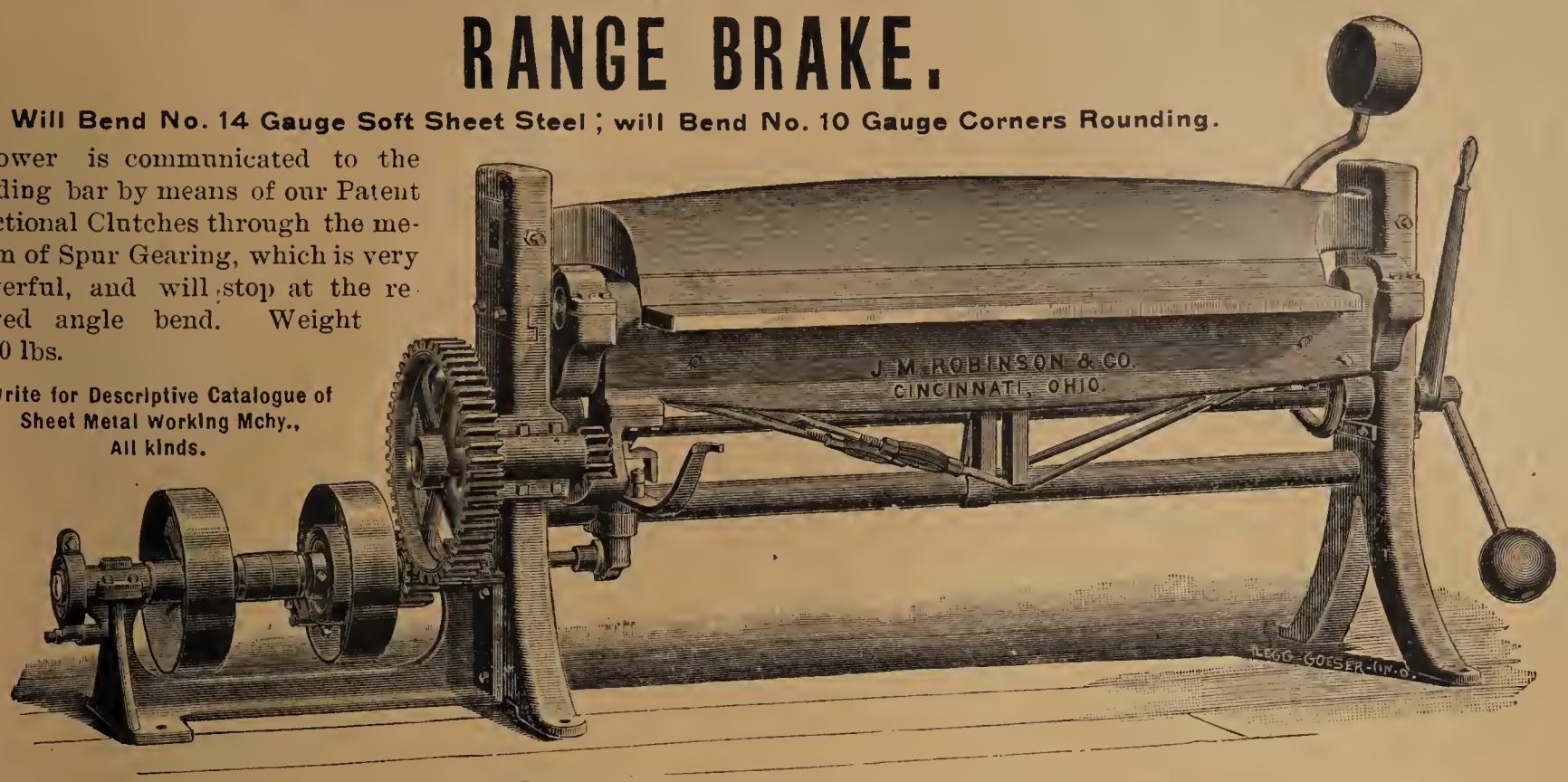


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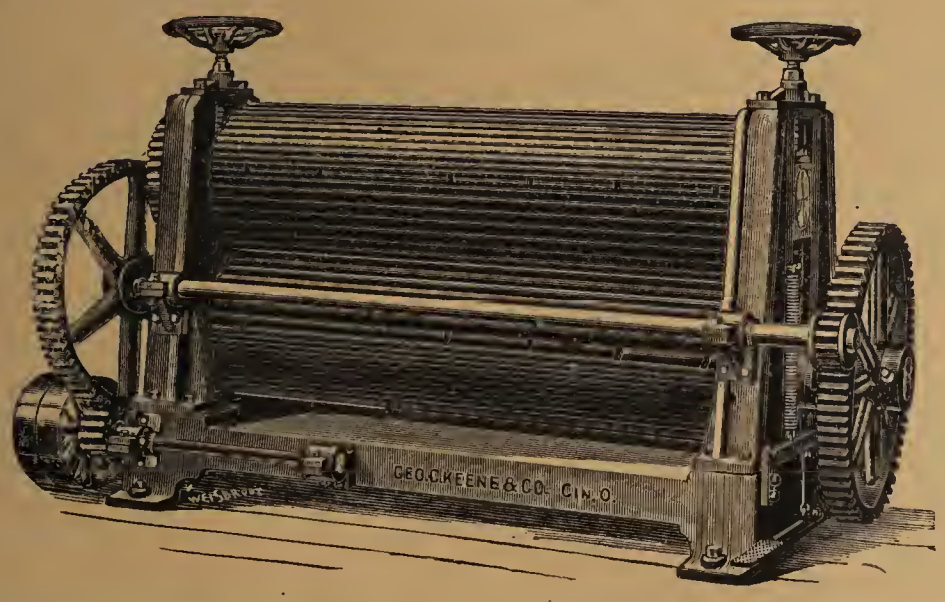
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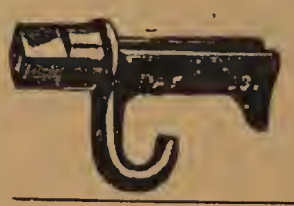
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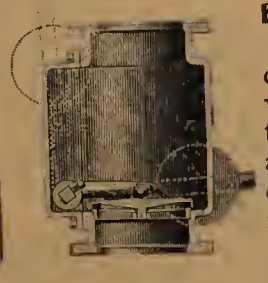
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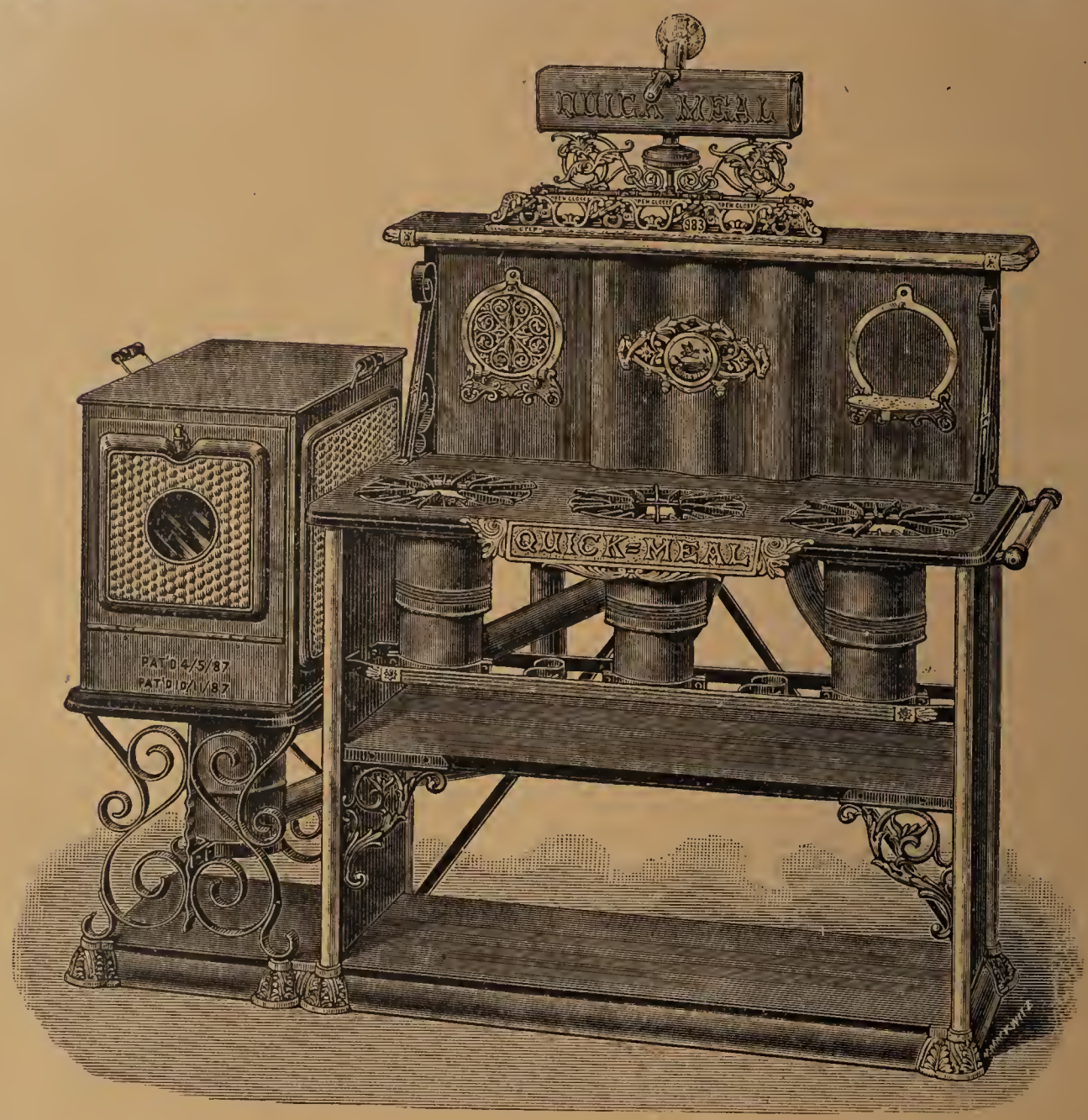
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1847-1898.

If Interested in Steam and Water Boilers—we make a most complete line, and you should send for our Boiler Catalogue and Prices.

CARTON FURNACE CO.,

Makers of Heating Apparatus for over *50 Years,*

UTICA, N. Y.

ECONOMY

J. F. PEASE FURNACE CO.

ECONOMY

Heating Surface

is a prime feature in the **PEASE ECONOMY FURNACES.** Their capacity is not measured from diameters of pot or casing but from constructions in which those two factors stand in proper relation with heating surfaces. These surfaces are liberal and effective. In all of our soft and hard coal burning furnaces the combustion chambers are high and ample—features which permit and ensure combustion of the gases directly over the fire and provide effective heating surface at the point where its utility is unquestionably sure.

This feature is time-tested. A Furnace with limited combustion chamber may save the use of materials and thereby save costs, but in operation the gases are not consumed, and, lacking adequate surface, its power to transmit heat from combustion is curtailed.

We invite attention to the superior character of the surfaces in the *Economy Furnaces.* Our catalogue illustrates this and many other advantages and is mailed, postpaid, to dealers.

Our line of furnaces embraces every style and type necessary for hard and soft coal, coke, gas, lignite or wood. They are equipped with three patterns of grates, with or without perfected air-blast appliance, constructed of steel or cast iron to meet the requirements of high and low grade fuels. Every Furnace is provided with a handsome nickel-plated Regulator with Thermometer. Prices are right.

We shall have two new types of Furnaces ready for the trade this month.

J. F. PEASE FURNACE CO.,

SYRACUSE, N. Y.

No. 86 E. Lake St., Chicago, Ill. No. 44 Centre St., New York.

SYRACUSE, N.Y.



RUSSEL WHEELER & SON
Wheeler
TRADE MARK
PALACE KING AND PALACE QUEEN
HOT AIR FURNACES
STEAM & HOT WATER BOILERS
STOVES
UTICA, N.Y. U.S.A.

We have heaters adapted to all sections of the country and for all kinds of fuel—Hard or Soft Coal, Coke or Natural Gas, etc.

Tell us your needs and we will do our best to fit you out.

Only recently a man in the West Indies wanted of us a furnace to burn dried cocoanut husks.

THE FORBES WARM AIR FURNACE.

I. NEWTON EVANS,
REAL ESTATE,
HATBORO PA.

TUESDAY AND FRIDAY,
221 SOUTH FIFTH STREET,
PHILADELPHIA.

HATBORO, PA., Dec. 26th, 1896.

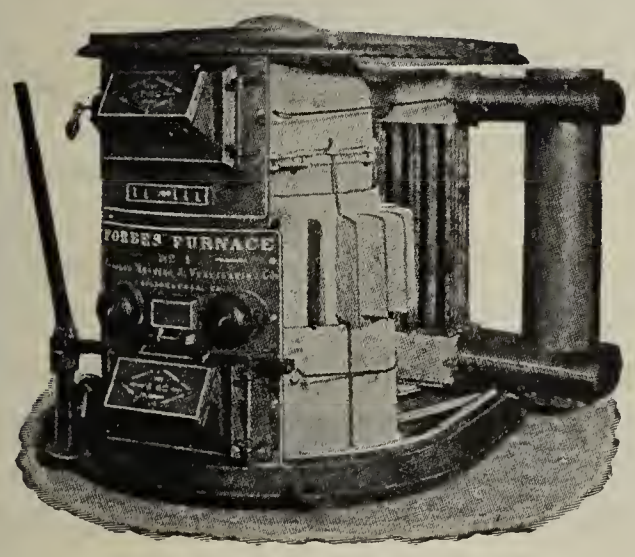
MR. JNO. FORBES,
Mgr. TUBULAR HEATING AND VENTILATING CO.

MY DEAR SIR :

In reply to your inquiry about the Forbes Furnace, would say I think it will be all you claimed for it. We have now had it about a month, and although the weather has not reached zero, it has been down to 10 degrees above. We have not had any difficulty in keeping our rooms comfortable, and do not think we shall during the remainder of the winter. It is easily managed and I think economical in the consumption of coal.

Very truly,
I. N. EVANS.

SEND FOR CATALOGUE



COLD SMOKE PIPE.

HOT AIR PIPE.

Heats with one-third to one-half the coal used by other furnaces.

Only 4 feet 3 inches high in the Largest Sizes.

. . . LOW PRICE . . .

TUBULAR HEATING AND VENTILATING COMPANY,

228 QUARRY STREET, PHILADELPHIA.

DO NOT SPECULATE

IN

Cheap or Experimental

LINES OF

Vapor or Oil Cooking Stoves.



The average mortal has troubles enough of his own without buying those of his neighbor.

Speculation in any of the above mentioned lines will drain your purse and put you to a world of trouble.

Seeds of prudence now well sown in the selection of a line that is both complete and honest will yield a profitable and happy harvest. A good beginning for 1898 means half the battle won.

If you are interested in the handsomest line made, write for our catalogue.

EXCLUSIVE AGENCIES GIVEN.

THE SCHNEIDER & TRENKAMP CO.,

CHICAGO, ILLINOIS. CLEVELAND, OHIO.

Dealers

who desire to attract the attention in these times of their customers to the merits of their wares must of necessity have some one or more leading specialties, commonly termed "Leaders," not necessarily Leaders in price, but in intrinsic value.

The

Monarch Line

GAS AND VAPOR STOVES, ETC.,

is one of such and is more generally used for the purpose by the trade than any other similar product. Do you handle it? If not, why not?

Get our BEAUTIFUL NEW CATALOGUE and read all about them.

The Monarch Stove and Mfg. Company, Mansfield, Ohio.

BRANCH HOUSES:

67 Lake St., Chicago. 284 Pearl St., New York City. 107 N. Second St., Philadelphia.
954 Penn Ave., Pittsburgh, Pa. 191 Eagle St., St. Paul, Minn. 12 W. 10th St., Kansas City, Mo.
Lincoln, Neb. H. Leonard & Sons, Grand Rapids, Mich. Kiechle, Brentano & Co., Evansville, Ind.

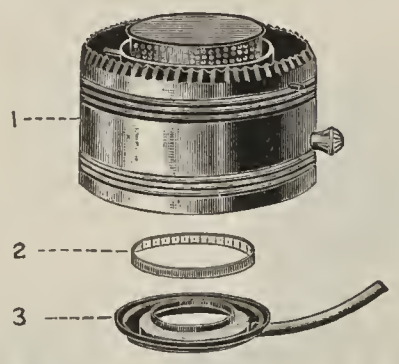
More Orders...

have been placed for Puritan Wickless Blue Flame Oil Stoves than have been placed for any other make. Nearly every Dealer who first bought a sample has now placed his stock order and secured the agency.

What better evidence is there of the superiority of an article?

You can burn the flame low and it

WILL NOT CREEP.



Only 3 Simple Parts to the Burner.



The Puritan has no complicated mechanism, nothing to get out of order, and is the most perfect in operation of any oil stove on the market.

MANUFACTURED BY

THE CLEVELAND FOUNDRY CO.,

CLEVELAND. BOSTON. SAN FRANCISCO, 132 Market Street.

A perfectly fitted steel Range.

THE ROUND OAK.



It is air tight!

Keeps Fire all night!

Takes little fuel!

Which means little wear—

thus—a life time of service.

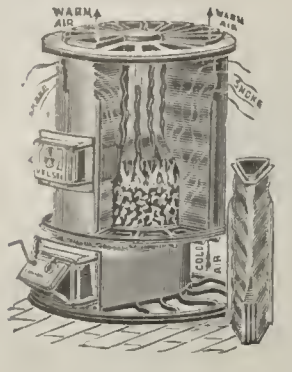
Bakes perfectly!

To the Dealer who likes to sell "Good Goods" this range will commend itself. Inquire for booklet.



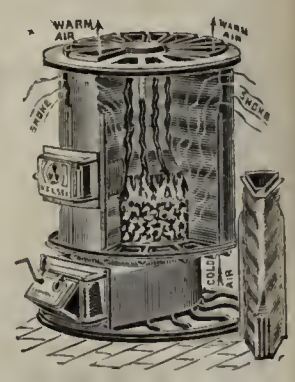
Estate of **P. D. BECKWITH,**

DOWAGIAC, MICH.



MORE

To Follow.



Office of A. E. GAY,
STEAM, GAS AND WATER FITTER,
And Dealer in
STEAM, GAS AND WATER PIPE AND FITTINGS OF EVERY DESCRIPTION.

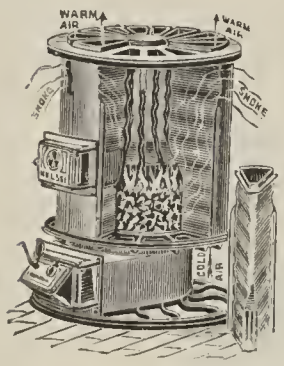
NASHUA, N. H., March 19th, 1898.

THE KELSEY FURNACE CO., Syracuse, N. Y.

DEAR SIRS:—Replying to your favor as to what I think of the Kelsey Generator, feel free to say that in the last 3 years I have placed some over 50 of your Kelsey Generators and they are in every case giving perfect satisfaction.

I thought so well of them that 2 years ago I took hot water out of my own home and put in a No. 24 Generator ; it is highly satisfactory and I find it most easy to operate and decidedly economical in fuel and can recommend it in every way to my trade.

Yours respectfully, A. E. GAY.

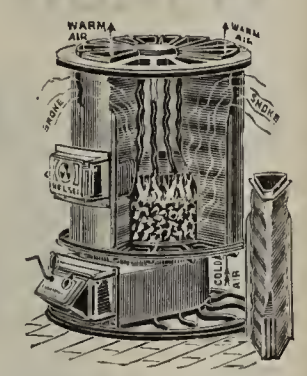


FOR CATALOGUE AND PRICES WRITE

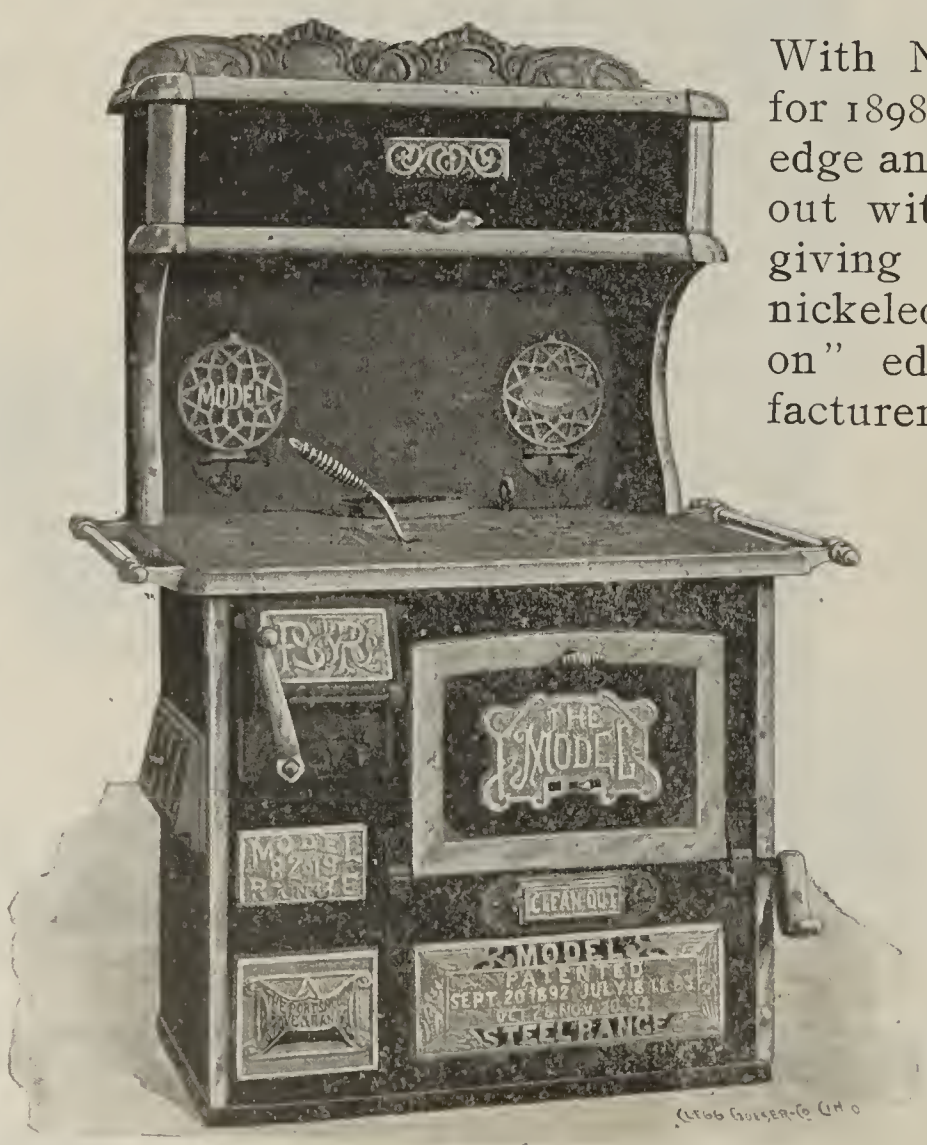
Kelsey Furnace Company,

SYRACUSE, N. Y.

239 Water Street, N. Y. City.
COOK & VAN EVERA CO., 173 Lake Street, Chicago, Ills.
JAMES SMART MANFG. CO., Brockville, Ont., Manufacturers for Canada.



The Model Steel Range.



With New Top Closet or Mantel Shelf for 1898. The edge of shelf, the bottom edge and top edge of closet are stamped out with dies made especially for same, giving a wide oval edge, heavily silver nickeled, doing away with the "Bolted on" edges now used by other manufacturers.

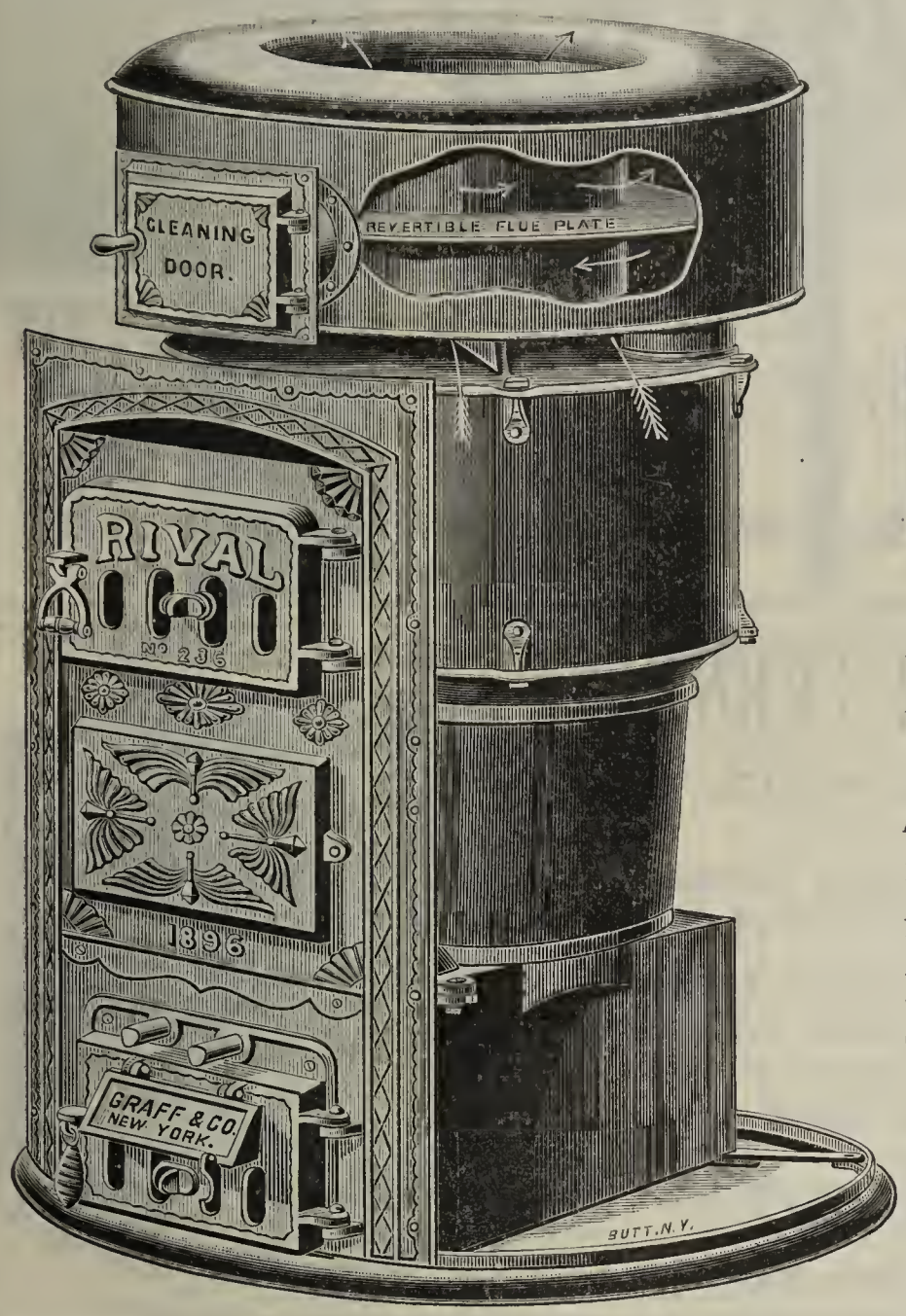
The "Model" is honest in size and weight, handsome in design, noiseless in operation, durable in use, easily operated, and as nearly perfect as mechanical art can make it. It is made in more sizes and styles than any other, so you can get just what you want if you look for it.

It is all that its name implies, and "THE PRICE IS RIGHT."

The Portsmouth Stove & Range Co.

Portsmouth, Ohio.

Buslest makers of Stoves and Ranges In the world.





We Point With Pride

to this unrivalled

Rival Furnace.

Because this construction secures ***as much radiating*** surface, ***and as great heating capacity,*** and ***is as easy to control and keep in order*** as any ***high-priced*** furnace. After two years' use many dealers say they never saw a furnace that could ***outheat*** it. We can give you ***more furnace*** at a ***low price*** than can be found elsewhere. ***Try*** and ***see!***

GRAFF & CO.,

Manufacturers,

208 Water Street, - New York.

PACIFIC RANGES

Are Best

BECAUSE

They're made stronger, better, more perfect than any other similar construction. You should write for prices and secure our Catalogue.

It is made with High Closet, Rolling Front, Six Holes, for Hard or Soft Coal; is the latest, best and handsomest Steel Range ever offered, one that you can offer as simply "out of sight" compared with that sold by the peddlers. Try it.

... THE ...

John Van Range Co.

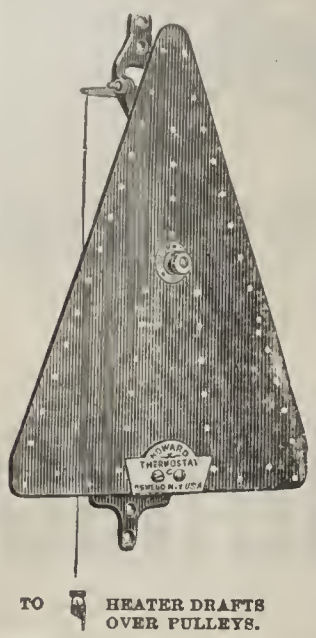
Warerooms:—419 ELM ST.;

Factories:—6-8-10 and 12 HOME ST.,

CINCINNATI, O.



THE THERMOSTAT,
A SENSITIVE PLATE.



TO HEATER DRAFTS OVER PULLEYS.

HOWARD

Automatic
DRAFT REGULATOR

NOW
is the time to
GET READY
FOR 1898-9 BUSINESS.
Let us send you a
SAMPLE
GUARANTEED.

HOWARD

Regulates
Furnaces and Boilers.

YOU should use it. *WHY?* It saves labor and worry about heater; gives nice heat; prevents danger from overheat, and

SAVES COAL.

MADE BY
HOWARD THERMOSTAT CO.,
OSWEGO, N. Y.

1/4 Off
LABOR,
WORRY,
BAD HEAT,
DANGER,
COAL.



EMPEROR FURNACES

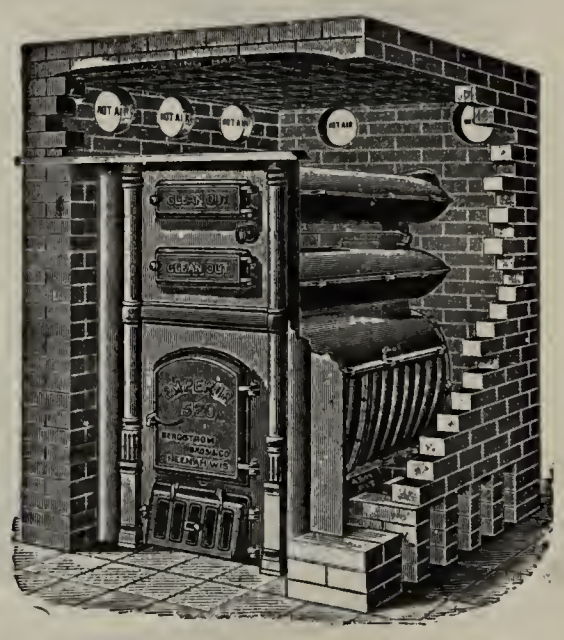
FOR WOOD.

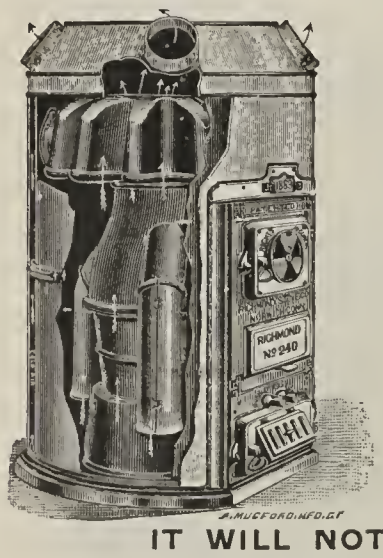
Simple, Safe Durable.
ECONOMICAL IN FUEL.
The Best and Cheapest Line of Wood Furnaces.
Furnished for either Brick or Galvanized iron Casing.

SEND FOR CATALOGUE.

Bergstrom Bros Co.

NEENAH, WIS.





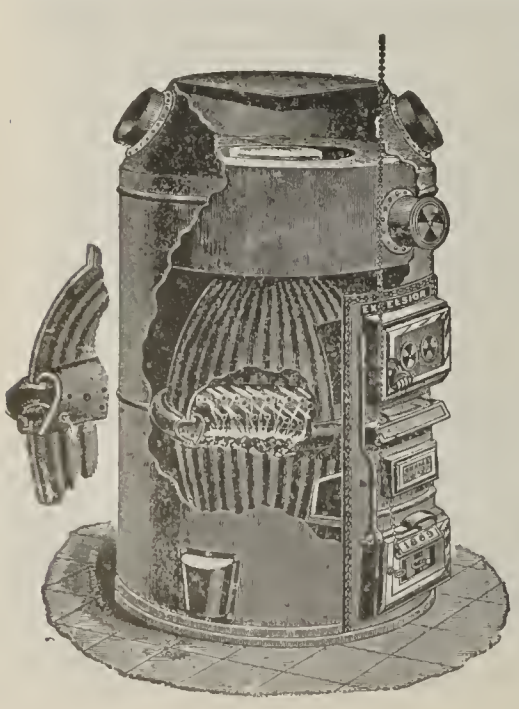
FURNACES TO BURN

Hard Coal, Soft Coal, Wood, Gas.

IT WILL NOT COST YOU ANYTHING TO GET OUR CATALOGUE AND PRICES.

THE RICHMOND STOVE COMPANY.

New York, 85 Centre Street. NORWICH, CONN.



FURNACES

AND

FITTINGS.

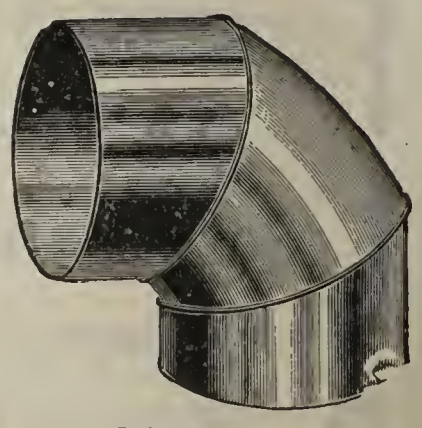
ALL SIZES, ALL KINDS.
IN ENDLESS VARIETY.
FIRST CLASS GOODS
AT ATTRACTIVE PRICES.

THE EXCELSIOR STEEL FURNACE CO.,

38 W. MONROE ST., CHICAGO.

See Page 31 of "Metal Worker" of Sept. 25th for cut of Grates, Radiator and Gas Ring of Furnace shown above.

The Original and only Complete Line



of Furnace Pipes and Fittings.

Gurney

HOT WATER HEATERS and STEAM BOILERS have proved themselves to be eminently satisfactory to the Trade and Fitter, in general, wherever used.

It shows a ***Bright Idea*** on the part of the fitter when he recommends the use of Gurney Boilers, as he knows they will stand up to their ratings and do all that we claim they will.

SEND FOR LATEST TRADE CATALOGUE.

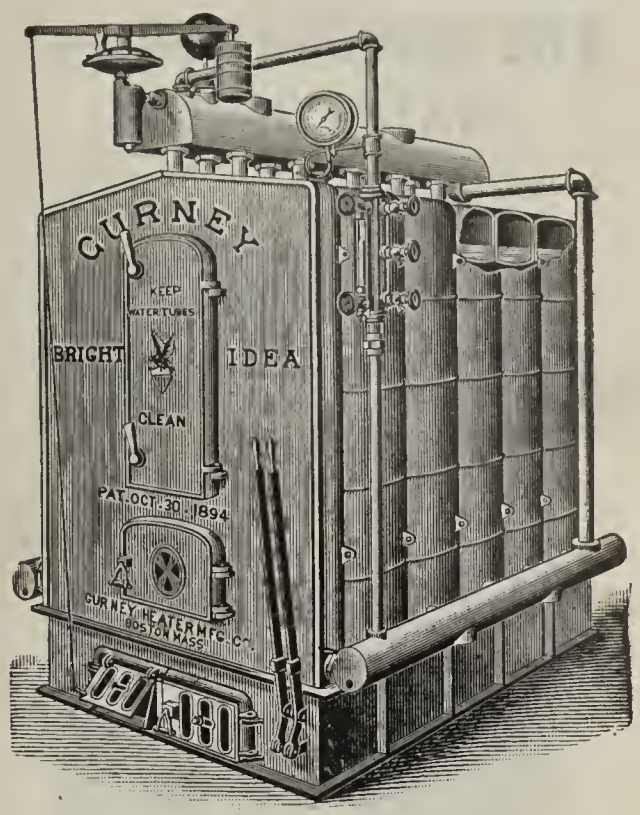
SOLD THROUGH THE TRADE.

GURNEY HEATER MFG. CO.,

74 Franklin Street, Cor. Arch,

BOSTON, MASS.

New York Branch:
48 CENTRE STREET.



"BRIGHT IDEA"
Safety Water Tube Steam Boiler.

KEEP YOUR I ON

The Plummer Heaters.

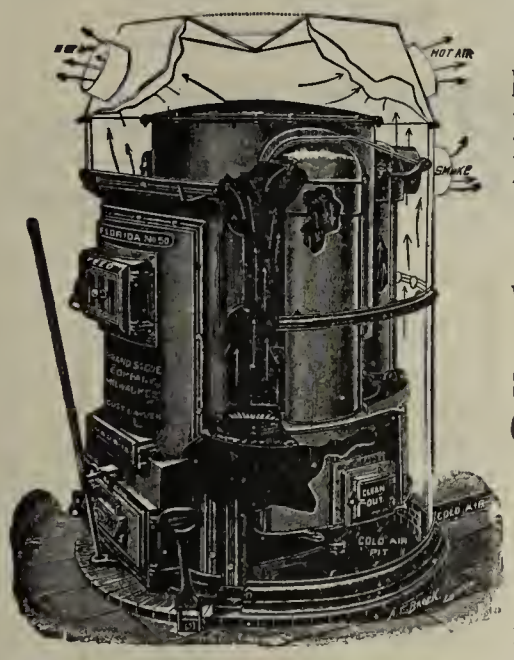
THE PLUMMER BRICK SET **STEAM HEATER,** NEW MODEL.

THE **LEADER** HOT WATER HEATER.

Made in our own plant. Send for Catalogue.

THE PUTNAM FOUNDRY & MACHINE CO., - Putnam, Conn.

THE FAMOUS FLORIDA.
FOR COAL.



Brand's Famous Furnaces.

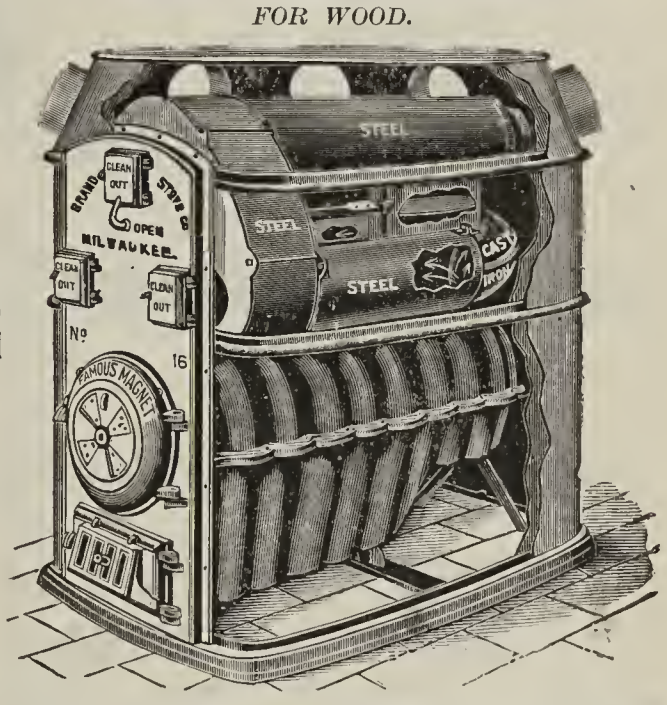
Revertible Flues.
Extra Large Radiator.
Heavy Fire Pot.
Revolving or Flat Grates.
Very Large Ash Pit Door.
Spacious Ash Pit.
Gas and Dust Proof.
Efficiency in Heating.
Large Radiating Surface.
Easy Access to Radiator.
Durability Unsurpassed
Made in 3 Sizes.
38-50-60 Inch Fire Boxes.

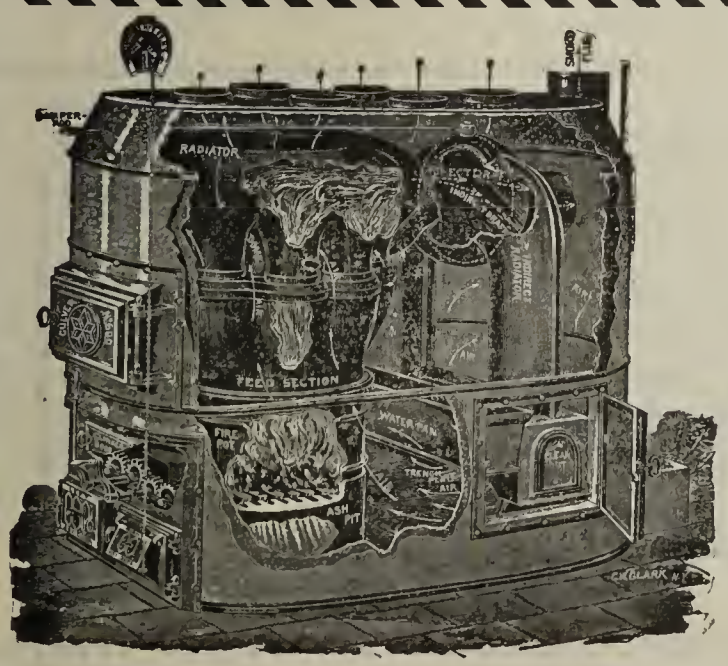
WRITE FOR CATALOGUE.

BRAND STOVE CO.,

MILWAUKEE. CHICAGO.

THE FAMOUS MAGNET.
FOR WOOD.





THE SIMONDS FURNACE CO.,

SUCCESSORS TO THE SIMONDS MANUFACTURING CO.,

No. 50 CLIFF ST., NEW YORK,

Manufacturers of the Celebrated

"CULVER AND MONTANA FURNACES."

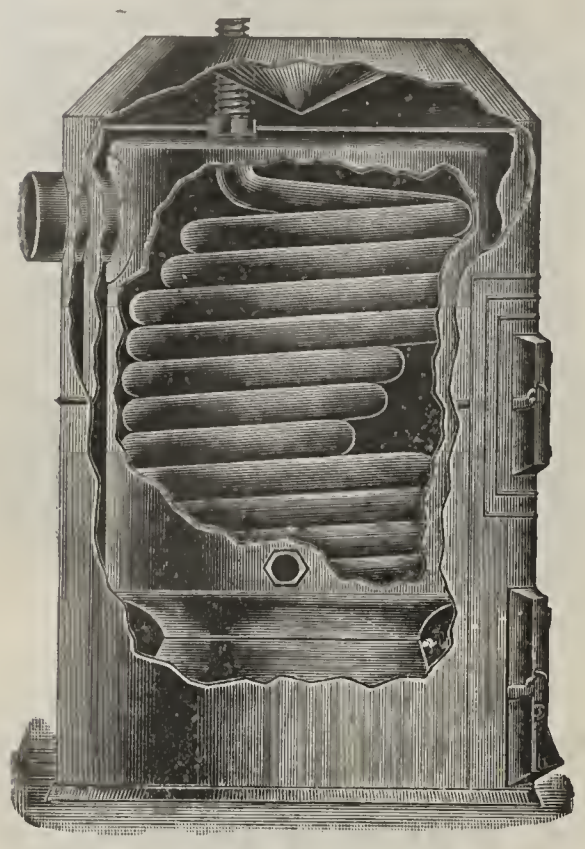
Double and Single Oven Ranges, with special features and latest designs.

STEAM AND HOT WATER BOILERS.

Our new Elliptic Furnace has unequaled radiating surface and is sure to give satisfaction.

Send for Catalogues and Prices.

THE COMBINATION HOT WATER HEATER



—— FOR HEATING ——

HOUSES, STORES, CONSERVATORIES, and BATH ROOMS

by the combination of hot air and hot water if desired, or hot water alone.

The National Pipe Bending Co.,

160 River St.,

NEW HAVEN, - - CONN.

L. O. KOVEN & BROTHER,

MANUFACTURERS OF

Galvanized and Plain Iron Boilers

OF ANY SIZE,

With Copper or iron Pipe Coils inside.

—ALSO—

Galvanized Range Boilers

AND

Expansion Tanks.

Office: 18 SPRUCE ST., NEW YORK.

—Buying by Sample.—A certain gentleman in this town is the proud possessor of a remarkably red nose. The term proud is used advisedly, as the owner is continually relating stories having a bearing on the brilliant hue of his nasal treasure. The following is one of them: He was in Exeter one afternoon and having completed his business, was amusing himself by an inspection of the shop windows.

While admiring some ties in a certain window, and considering whether he should speculate or not, a little girl came out of the establishment, and finally caught him by the sleeve.

"Please, will you come into the shop with me, only for a minute?" she asked.

"Certainly," answered the gentleman, following her at once. Arrived at the counter, the little one astonished everybody by remarking: "Theer, miss, muvver wants a ribbin the same color as this gentleman's nose."—*Weekly Telegraph.*



"SURE CURE FOR A COLD HOUSE."

Bundy TRADE MARK

HEATERS.	STEAM TRAPS.
RADIATORS.	SEPARATORS
SUPPLIES.	FEED WATER HEATERS.

A. A. GRIFFING IRON CO.

New York, 66-68 Centre Street.
Boston, Mass., 177-179 Fort Hill Square.
Philadelphia, Pa., 702 Arch Street.
Works, Jersey City, N. J. Send for Book—MW.



The Mitchell Water Heater.

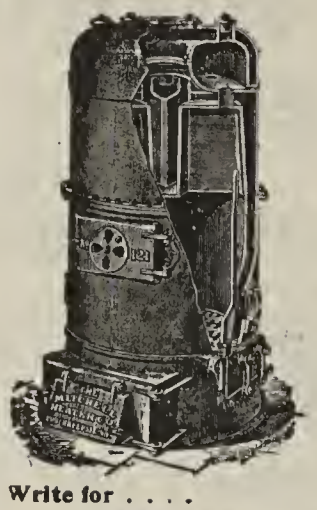
Has no Joints to Burn Out or Leak.

Heating Surface all in One Casting.

Water Passages all Vertical.

Largest Amount of Fire Surface.

OUR 100 SERIES FOR STEAM OR HOT WATER.



Is constructed on the same general principle, but arranged to be used without jacket.

If you have competition and want to make a low estimate to secure the job, we can help you do it.

Write for . . . . Catalogue and Prices.. **THE MITCHELL HEATER CO.,** 50-60 Pine St., POUGHKEEPSIE, N. Y.

More actual talking points in the Front Rank Furnace than in any other now offered to the trade. For satisfaction—use the Front Rank.

There are more Front Rank Furnaces sold in the City of St. Louis than all the other furnaces combined. Houses with them in stay rented. To rent your house use Front Rank.

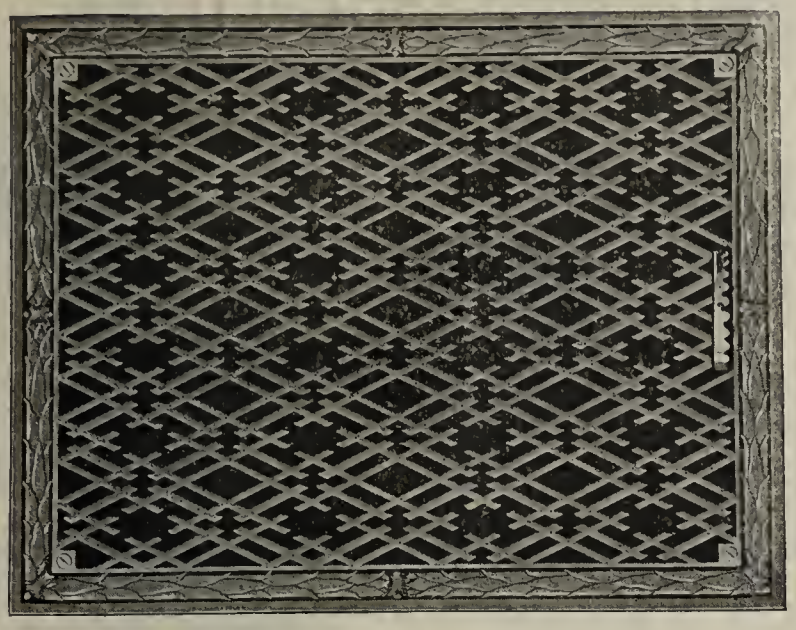
Made of heavy wrought steel which cannot crack. A cracked furnace is N. G. To prevent the possibility of having a cracked furnace use the Front Rank.

Made only by

FRONT RANK STEEL FURNACE CO.,

ST. LOUIS.

WRITE FOR CATALOGUE "M."



Manhattan Diamond Design.
New 1898.

The Ferrosteel Company,

Main Offices and Warerooms:
CLEVELAND, OHIO.

Branches:
New York City, 105 Beekman Street.
Boston, - - 92 North Street.
Chicago, - - 45 and 47 Lake St.

Sole Producers of "FERROSTEEL."

TWO WORKS are now in operation by THE FERROSTEEL COMPANY—one, devoted exclusively to the manufacture of

Ferrosteel Warm Air Registers and Ventilators,

the other, to the manufacture of

Ferrosteel Special Cold Handled Sad Irons,

and "Mrs. Potts" Irons.

To facilitate distribution we have established branches at NEW YORK CITY, BOSTON, CHICAGO.

Jobbers at nearly every prominent center of trade are making a specialty of FERROSTEEL PRODUCTS.

THE

"BLUE BOOK for the REGISTER TRADE,"

1898 Edition,

SHOULD BE IN THE HANDS OF EVERY USER OF REGISTERS.
PLEASE WRITE FOR COPY.

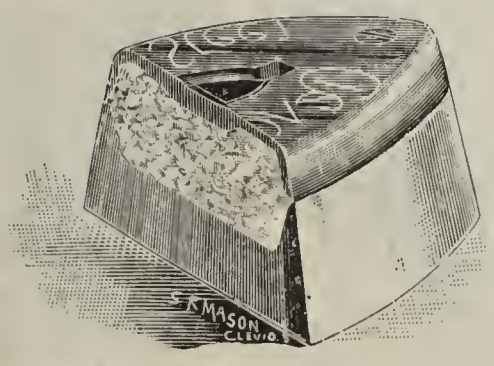
The No. 20 Ferrosteel Special Iron

having a smooth top is easily kept clean.

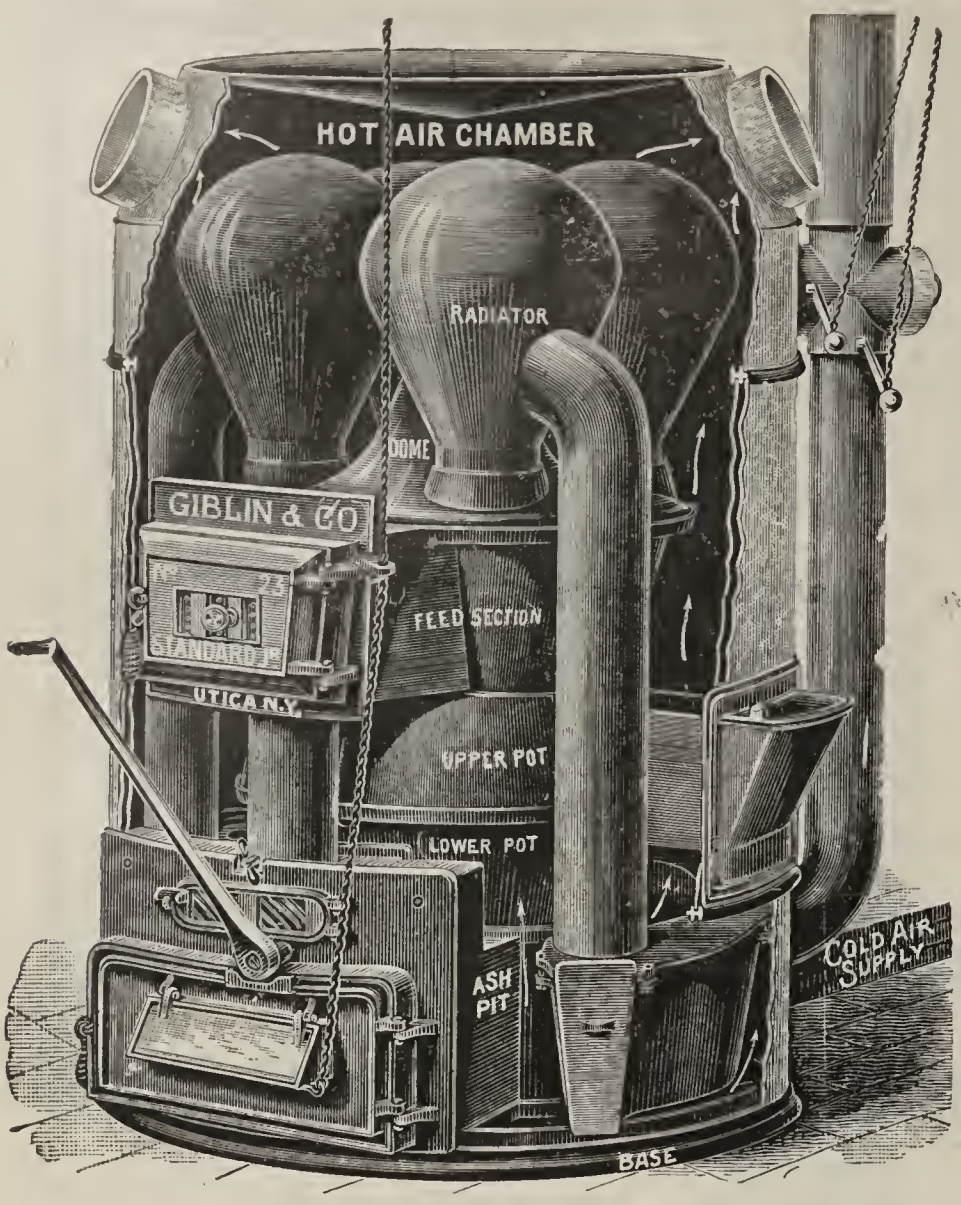
The Asbestos Fibre Lining protects the top from excessive heat and also the handle—and as the heat does not escape through the top, it is deflected to the base, thus adding to the ironing power.

The construction of the handle enables it to be easily kept clean.

The top and handle are electroplated in Antique Bronze, making finish very attractive.



Sectional Cut showing Asbestos Fibre Lining.



BUSINESS-BUILDING

to have any permanence must be based on TRUTH and HONESTY Selling furnaces if conducted in accordance with above statement will secure for the dealer a permanent and profitable business. To heat a residence or any other building requires

Intelligence
Good Materials
Honest Workmanship

to plan,

to use,

to erect.

A good furnace dealer has the intelligence and the workmanship and

WE FURNISH THE FURNACE,

that essential part of the material, and if all else is good, SUCCESS is SURE.

Intelligence, good materials, good workmanship naturally cost more than the opposites, and the best business policy is to supply these without regard to the low prices of the man across the way, who makes an assignment annually and who sells for any price obtainable.

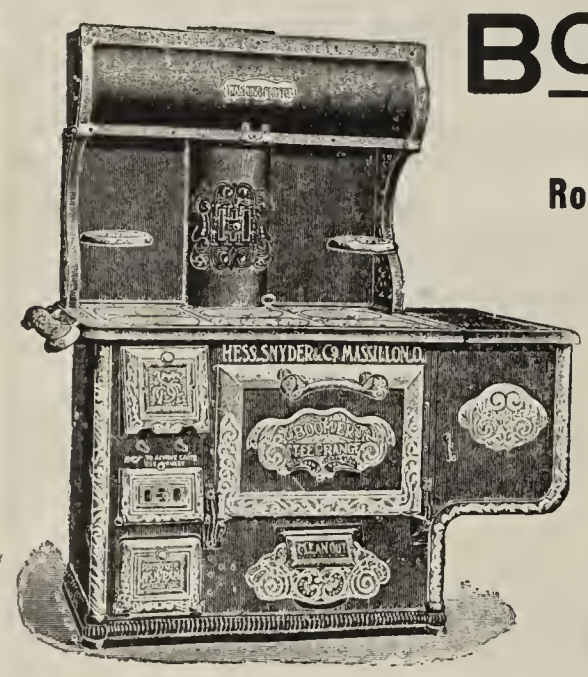
IT IS A FACT that the majority of the failures within the past five years among the furnace dealers are those who made low prices, sold cheap furnaces, did cheap work.

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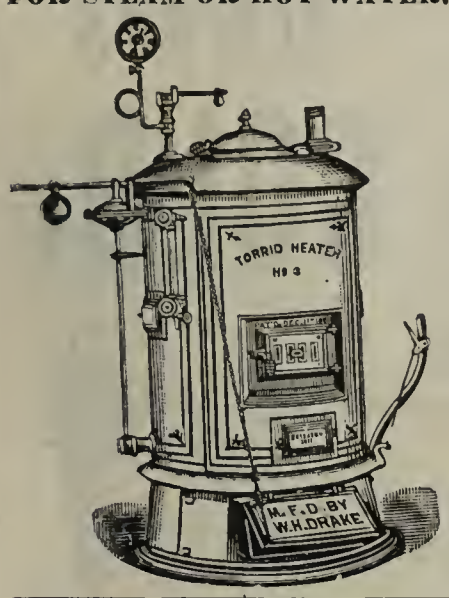
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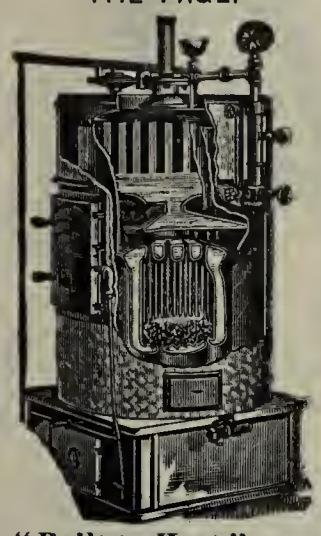
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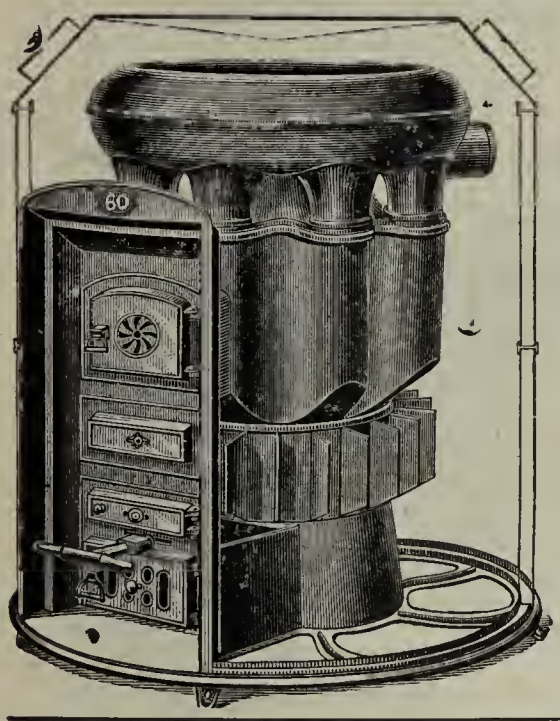
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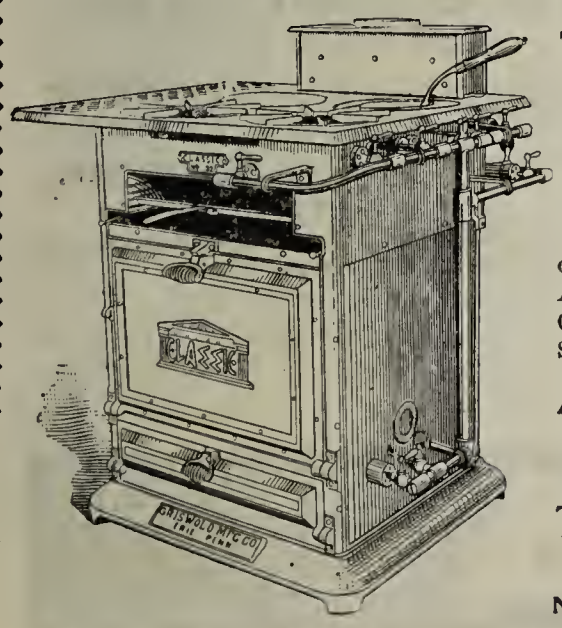
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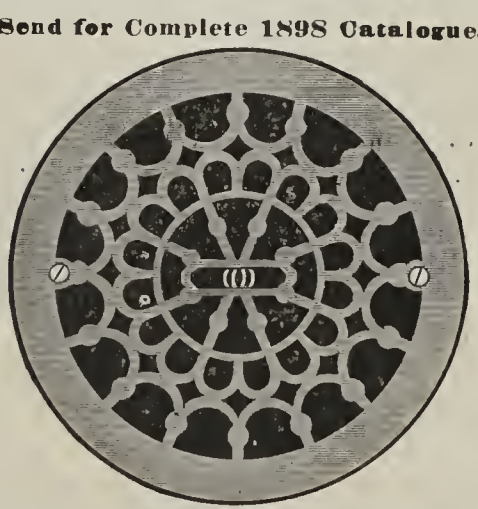
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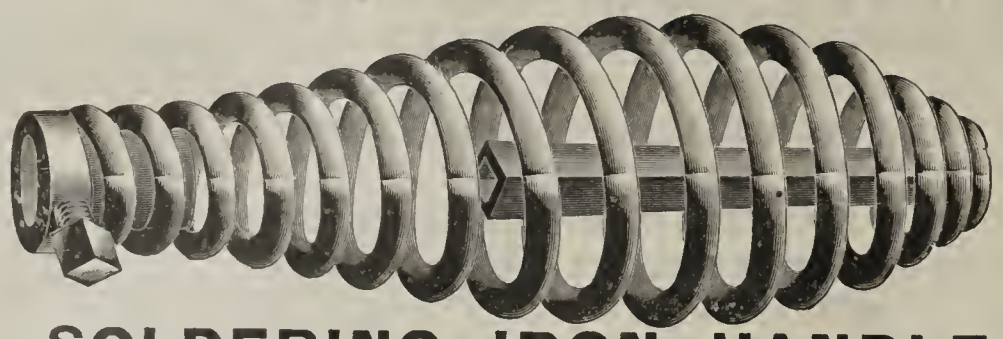


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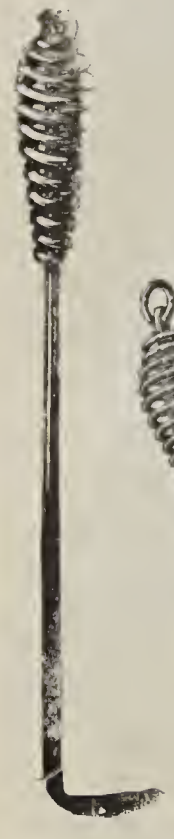
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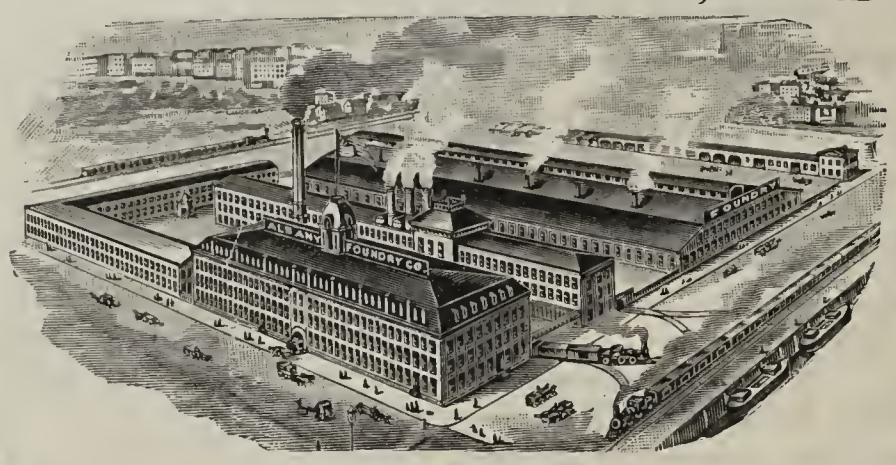
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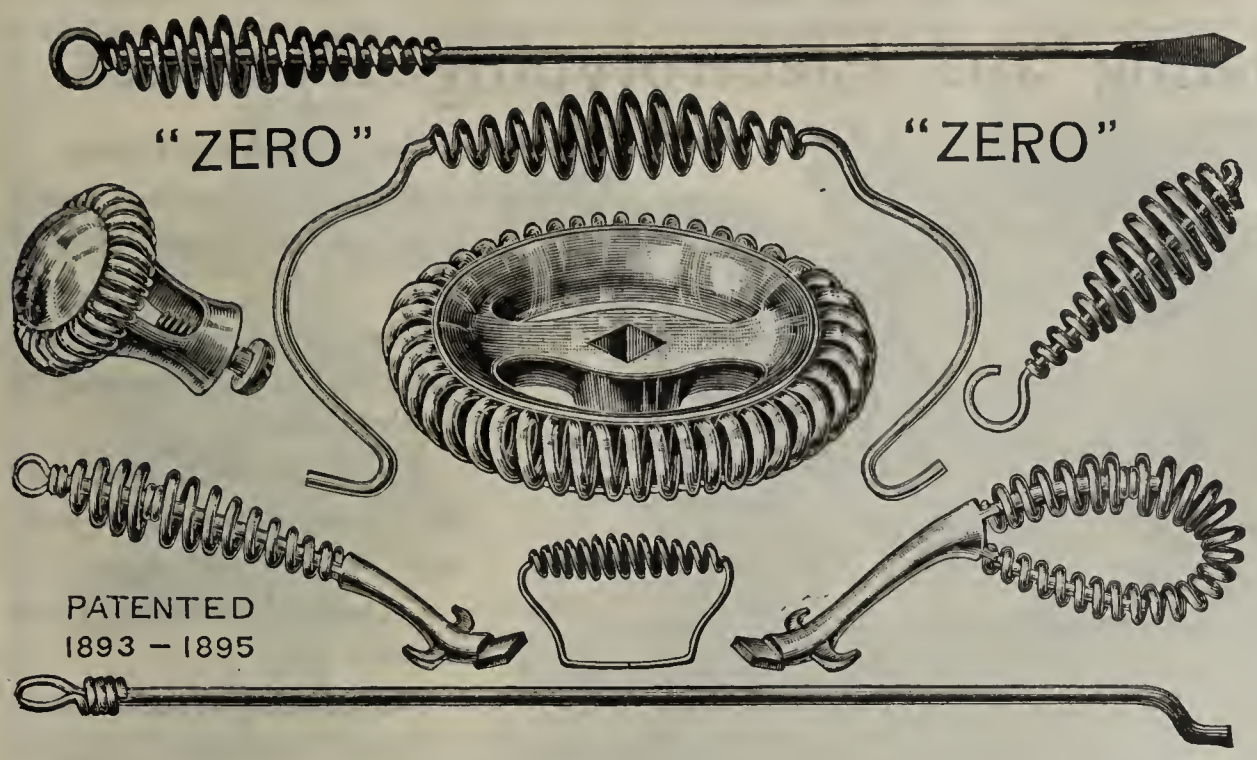
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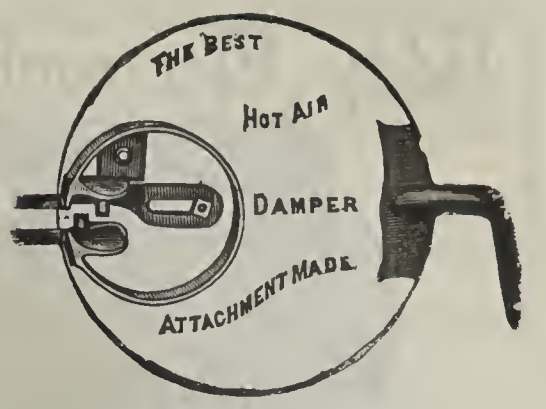
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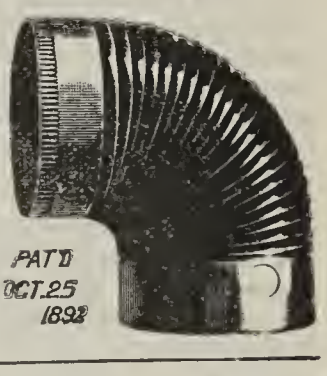
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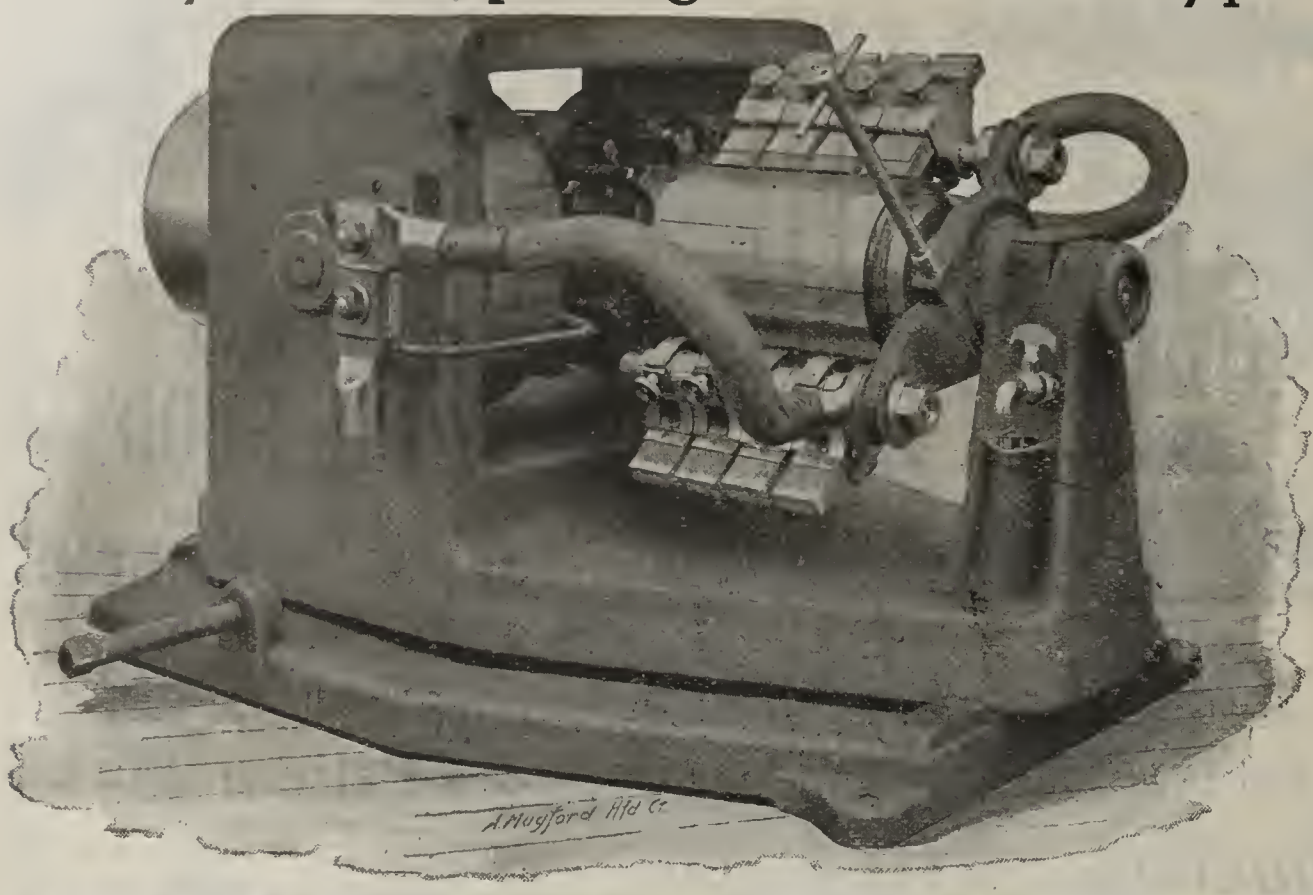
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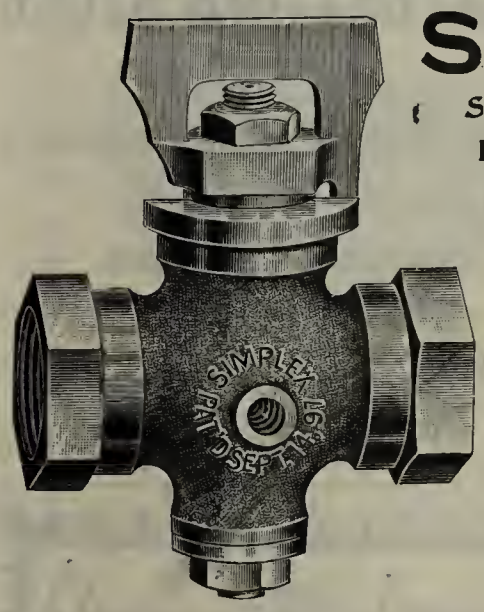
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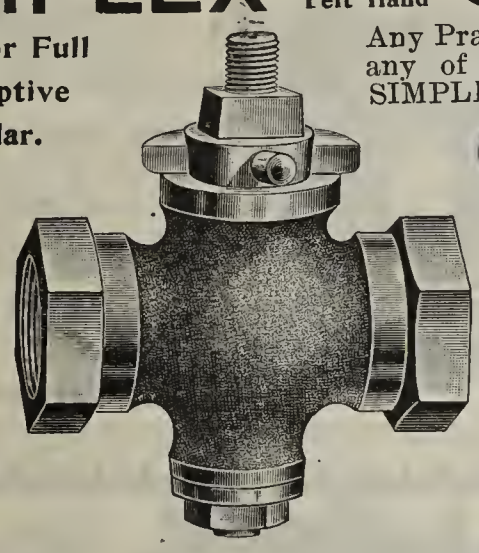
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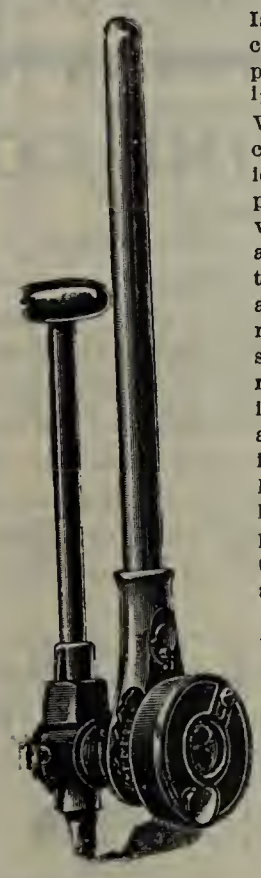
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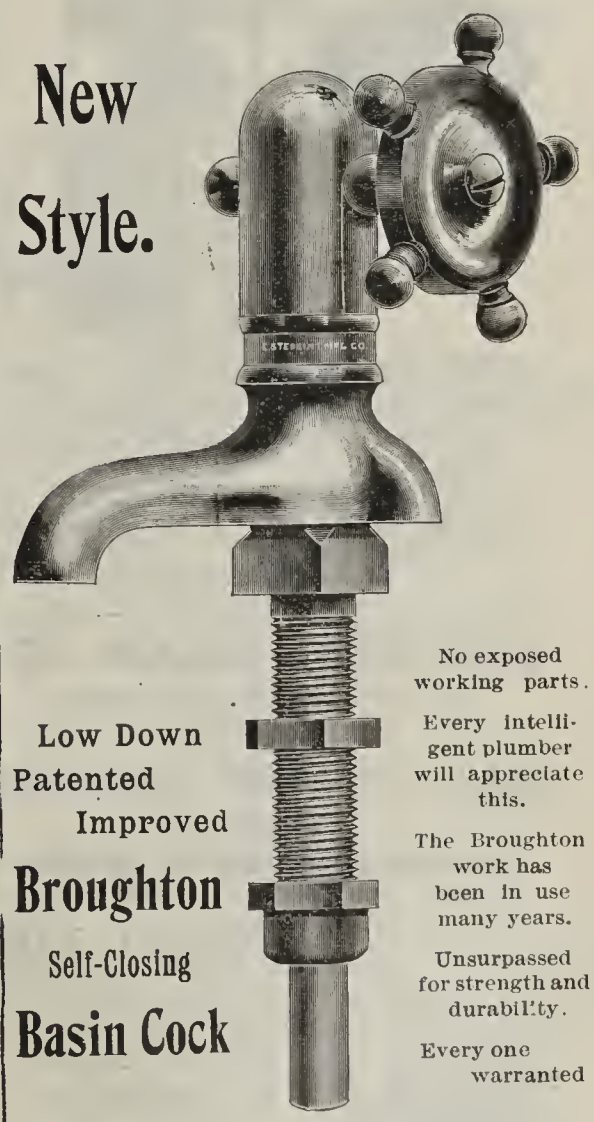
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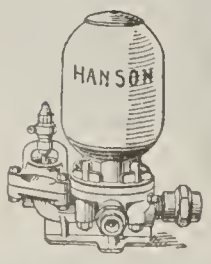


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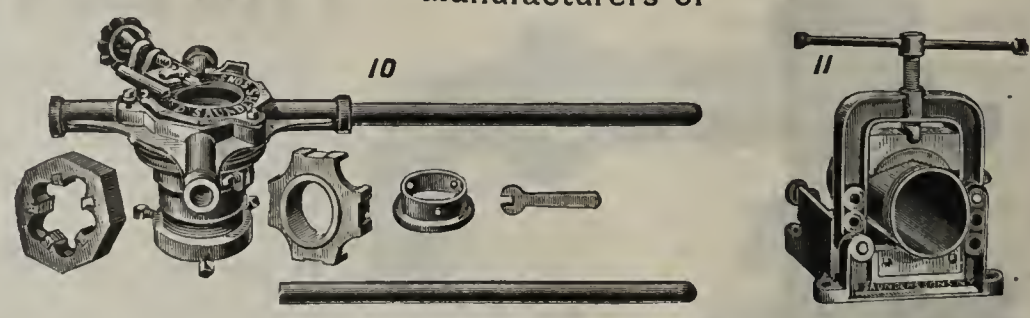
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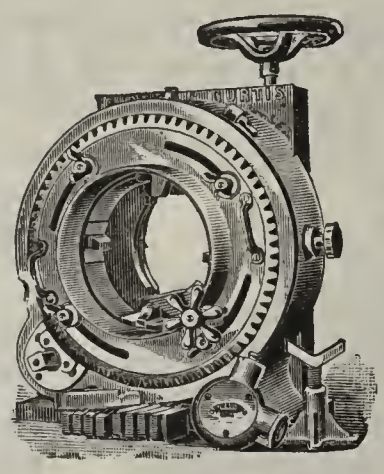
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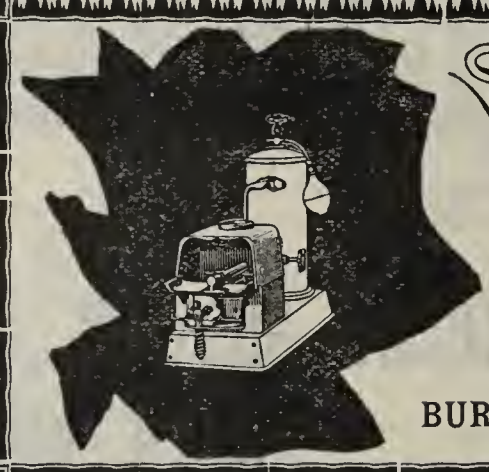


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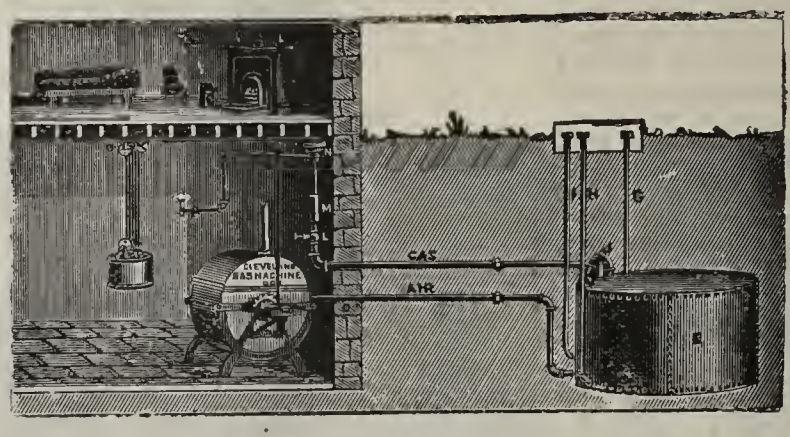
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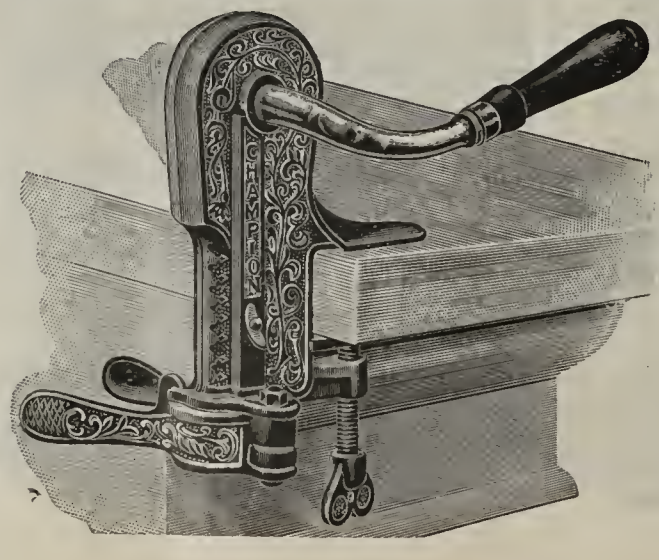
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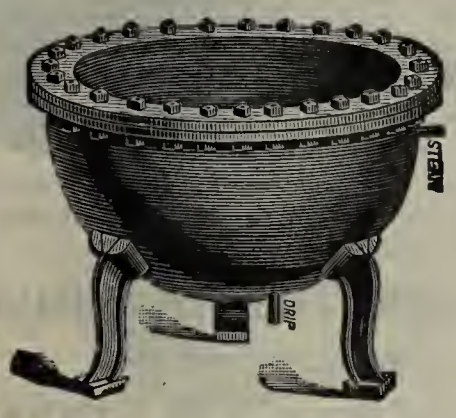
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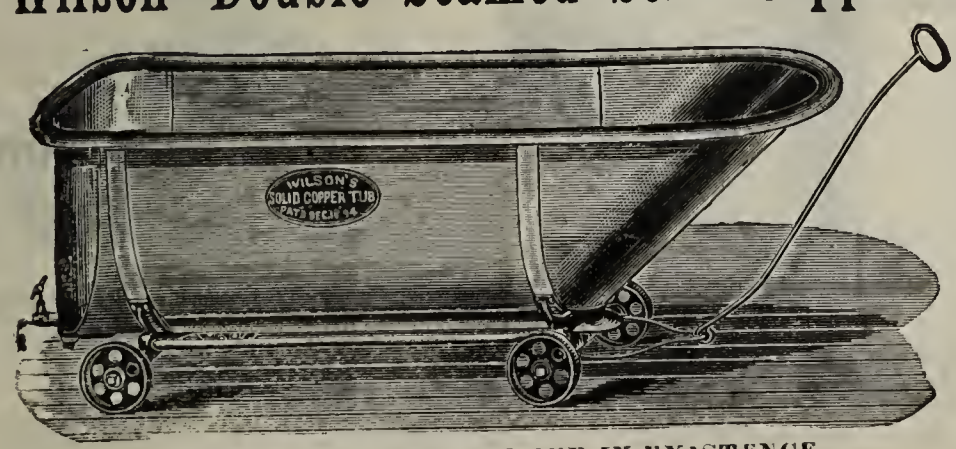
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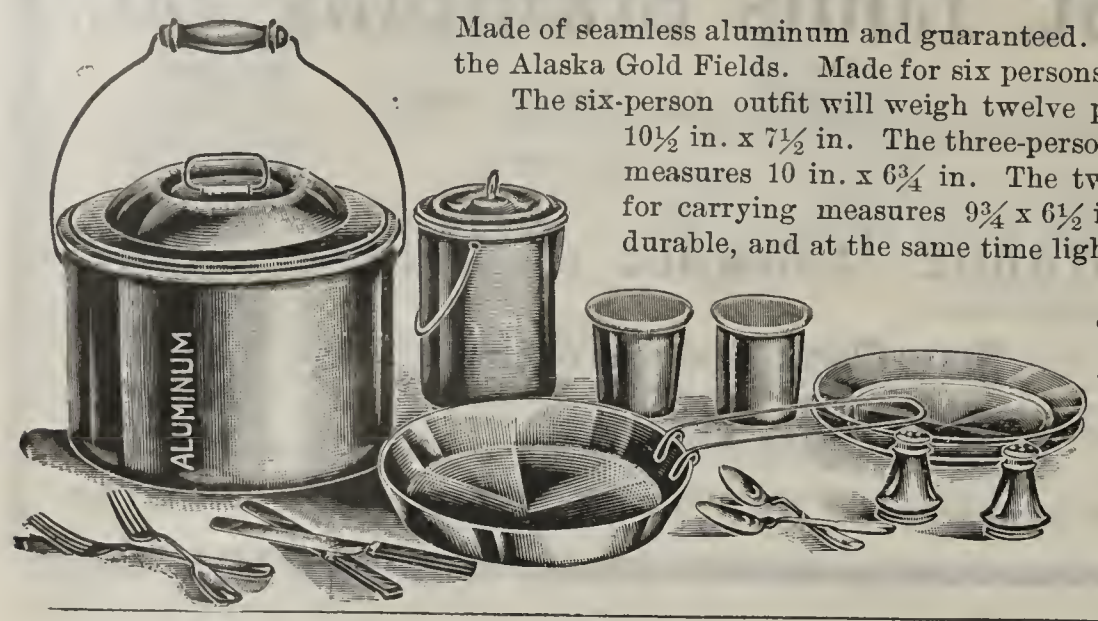
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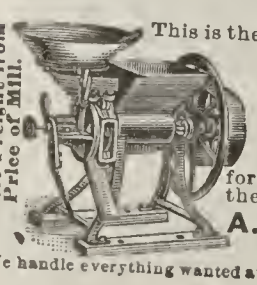
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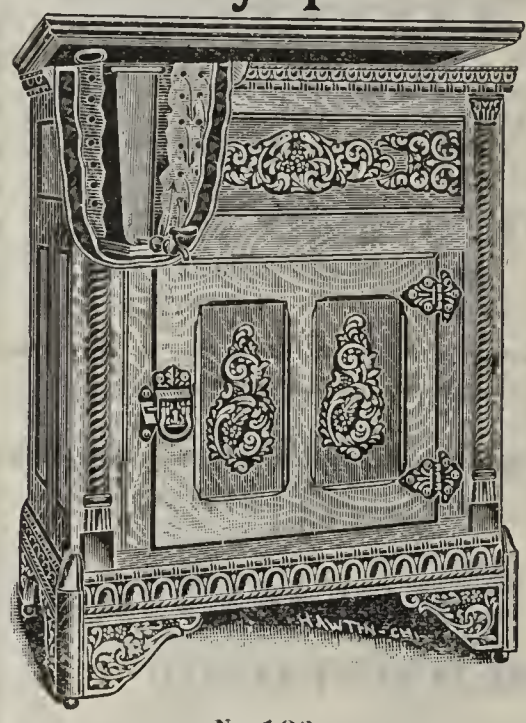
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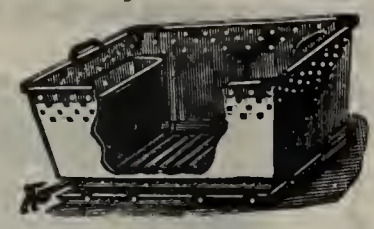
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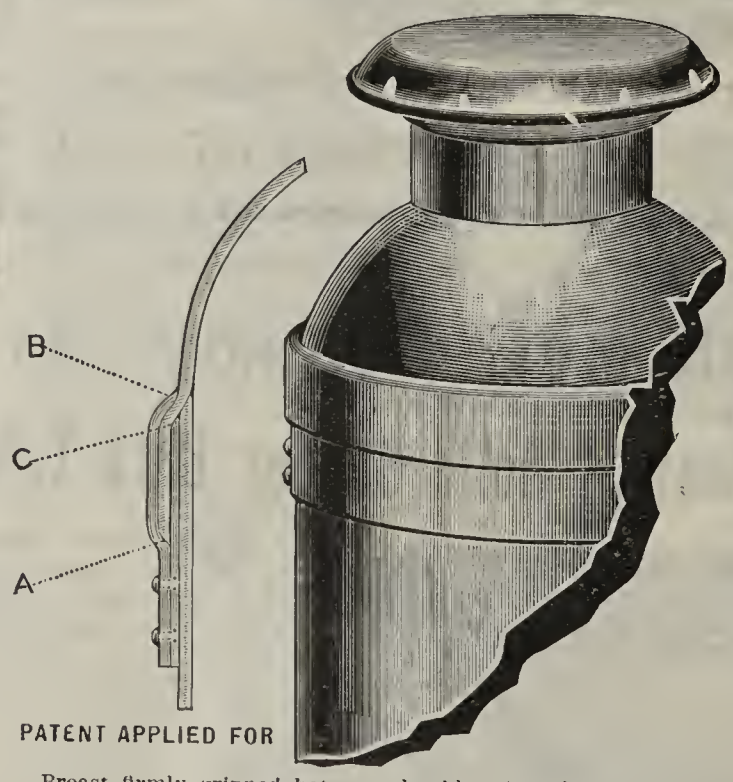
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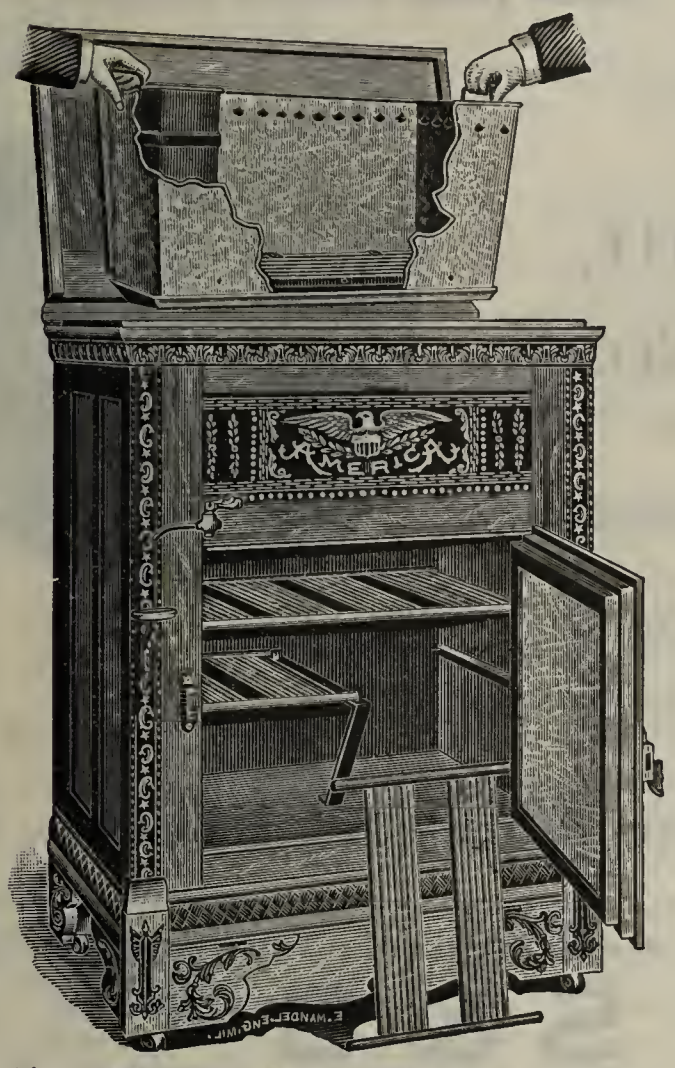
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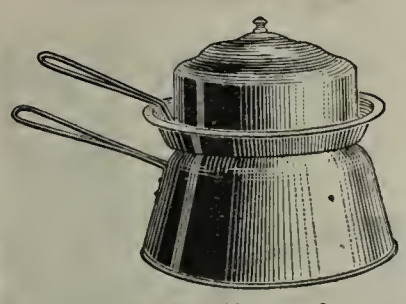
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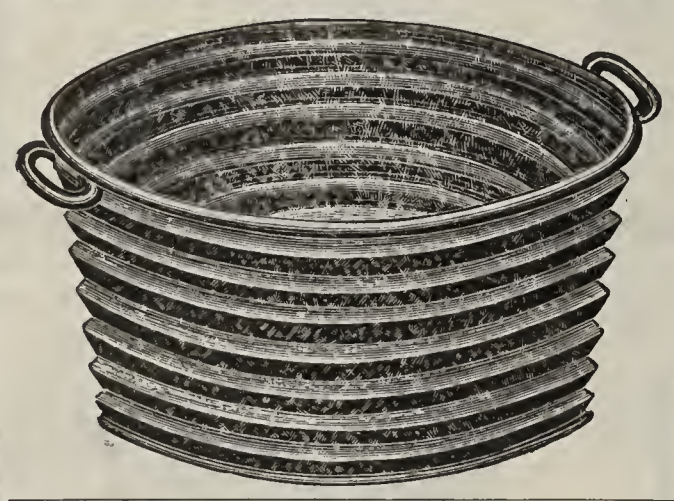


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Diameter at bottom, inches,	16⅛	18	19⅝	21
Capacity, quarts,	44	52	62	71

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Strongest, Best AND Most Handsome Wash Tub Made.

NO BUCKLING OR BENDING.

CORRUGATED ON BOTH SIDES AND BOTTOM.
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Highest Candle Power.
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Entirely Free of Shrinkage.
Every Mantle Warranted to be Perfect in Shape.
Goods Securely Packed for Shipping.

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A PRACTICAL TREATISE ON WORKING SHEET COPPER INTO ALL FORMS.

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THIS book is brought out to meet the needs of a body of sheet metal workers whose trade has never before been thoroughly described. The author has acquired proficiency in copper working through a long apprenticeship and many years of actual labor at the bench. The instruction he gives is, therefore, entirely practical and will be correspondingly valued by those who are in any way interested in coppersmithing. A special feature of the work is the illustrations, of which there are 474, and which add much not only to the interest but the value of the text, as they show the work in all stages of progress and illustrate all the appliances, patterns and tools. The work is divided into sections, each treating a separate topic, and is thoroughly indexed. The style of the writing is exceedingly simple, and the descriptions of work go into the smallest details.



Fig. 107.—Planishing Tea-Kettle Side.

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Historical Sketch of Copper; Braziers' Art, or Light Coppersmithing; First Year's Experience; Repairing and Tinning; The Boy's Second Year; Making Washing Coppers; Making Small Brewing Coppers; Table of Dimensions and Capacity; Making Hand Bowls; Making Frying Pans; Making Closet Pans; Making Water Balls; Mounting for Copper Goods; Glue Pots and Tea-Kettles; Oval Tea-Kettles; Beer Mullers; Funnels; Coffee Pots; Saucepans and Pudding Pots; Stewpans; Stock Pots; Fish Kettles; Brazing Pans; Tea Boilers; Warming Pans; Preserving Pans; Dripping Pans; Coal Scoops and Coal Hods; Making Coal Scoops; Planishing and Smoothing; Cranes or Syphons; Pumps; Appliances of Railway and Marine Coppersmiths; Making Copper Pipe; Piecing and Joining Pipes; The Fire Pots; Fire Pot Set for Brazing Joint; Soft Soldering Large Joints; Taking Templates; Filling and Bending; Making Bends; Template Boards; Patching Pipes; Outlets; Expansion Joints; Tee Pieces; Three-way Pieces; Cross or Four-way Pieces; Saddle Fire; Marine Work; View of Maudsley, Sons & Field's Shop; Making Large Bends; Making Double Bends; Brazing on Flanges; Short Bends; Air Pipes for Ships; Making Hollow Spheres; Brazing Sheet Brass; Locomotive Brass Work; Brass Dome Covers; Heavy Pipes for Breweries; Brewing Coppers or Kettles; Dome Coppers; Dome and Pan Coppers; Tallow Coppers; Dyers' Coppers; Sugar Tieches; Stills.

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—WONDERFUL RESOURCES—It was a Saturday afternoon train out of town, and the smoking-car had a half-dozen fishermen bound for Cedar Lake. Each man had an array of tackle and a moist cheesecloth bag, within which something was wriggling and kicking.

"What's in there?" asked the man with an undergrowth of whiskers of one of the fishermen.

"Frogs."

"Where in Sam Hill did you ketch any frogs here in Chicago?"

"I bought them."

"Whereabouts?"

"Up at one of the big department stores."

"You git out! You didn't, did you?"

"Certainly. You can buy frogs for bait up there—25 cents a dozen."

"Well, doggone! I guess you can get most anything at one o' them big stores, if the truth 'uz known."

"That's right. While the girl was picking out the frogs for me I went down to the floor below and had a tooth pulled."

"Well, I swan!"

"Then I had a little time to spare, so I took a bath"—

"Right in the store?"

"Certainly. They have a bath department in every store. Then I got a man to mow the grass up at my house."

"You did?"

"Yes, and paid my taxes. You pay your taxes on the same floor that you get the baths. They're convenient, those department stores. When I got through with all my other business I found I had about twenty minutes to spare, so I took a bicycle lesson.

"They let you take wheels, eh?"

"No—ride on the roof. They've got a quarter-mile track on the roof. There must have been fifty people up there riding to-day."

"Say"——

"That's a fact! You can do anything at a department store. Now, just before I left to-day I applied for a divorce from my wife."

"You go plumb to grass!" exclaimed the inquisite man, and he moved to another seat.—*The Chicago Record.*

—CONSIDERATE.—"Here's an account of a Colorado girl who climbed to the top of Mount Popocatapetl and sang "The Star-Spangled Banner."

"She had some sense, didn't she? It's too bad some other girls are not as thoughtful when they want to sing."—*Chicago Post.*

—THE TORTOISE AND THE HARE.—"You remember the story of the tortoise and the hare, and who won the race?"

"Of course, but I see nothing strange in the finish. The soup always does precede the entrées, doesn't it?"—*Cincinnati Enquirer.*

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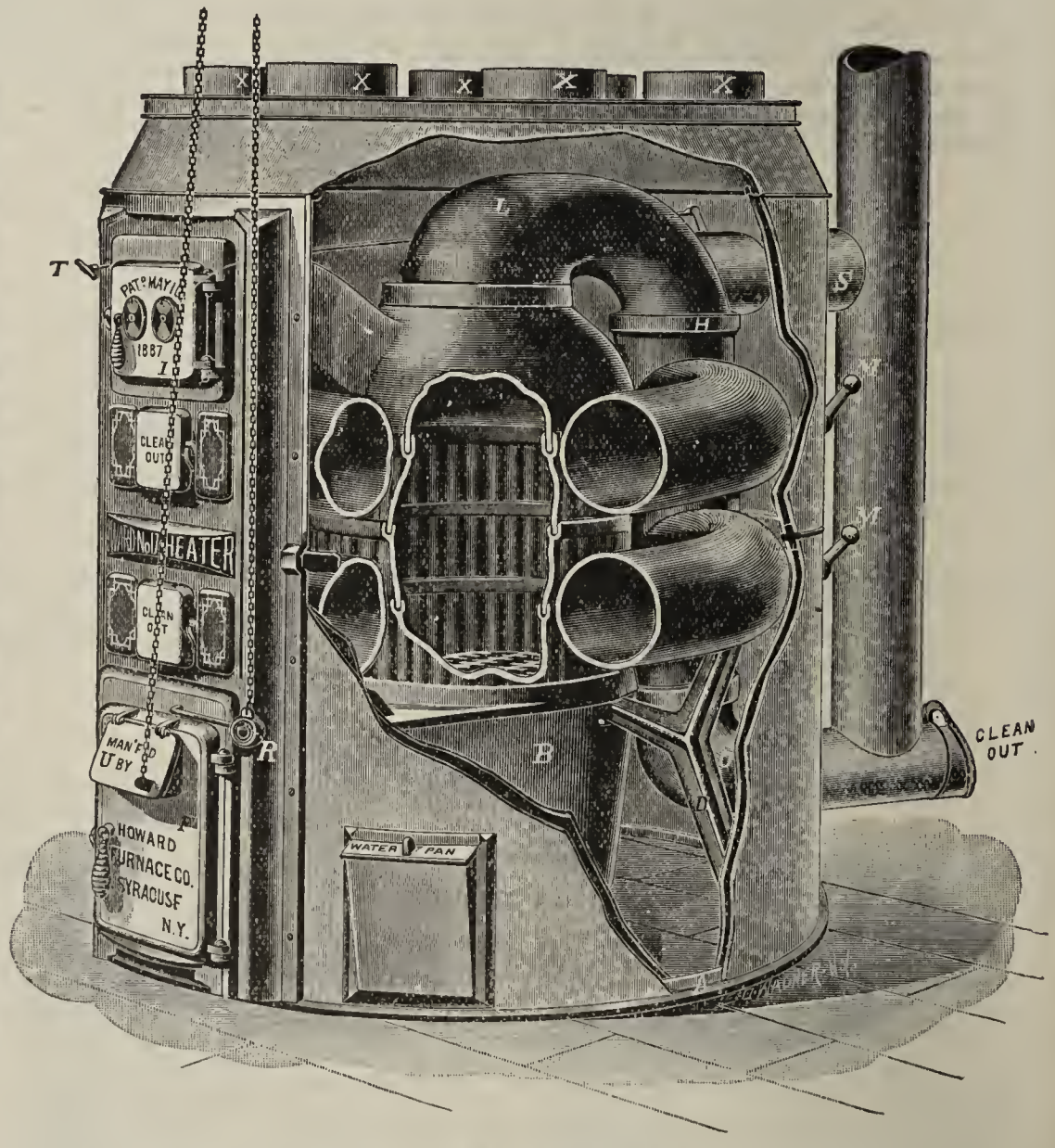
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BEST TRADE.

These heaters are not cheaply made, there is nothing flimsy about them, yet are sold at low prices. Full value is given for all they cost. Satisfaction is guaranteed in every instance, when properly placed.

When a combination Hot Water and Warm Air Furnace is needed, the addition of the Howard ADJUSTABLE DISC BOILER makes an unexcelled generator of heat, satisfactory in all its workings.



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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, March 26, 1898.

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Index to Reading Matter.....Page 54.

The Business Situation.

The Cuban question has been the topic of overwhelming interest during the week in business circles. The existing uncertainty and the apprehension of an outbreak of hostilities with Spain occupy the public mind more and more as matters seem to be approaching a focus. Naturally enough, the business of the country has been affected to a considerable extent by the prevailing excitement. Buyers and investors are holding off pending developments, and projected enterprises are delayed until something definite is learned as to the outcome of the present difficulties. The shadow of a possible conflict has had a distinctly depressing influence on the speculative markets, where the volume of business has shrunk to almost insignificant proportions in the past few days. Securities are weak and declining, even Government bonds falling sharply. Wall street is nervously awaiting the publication of the "Maine" report and a definite announcement of the policy of the Administration, which are looked for within a few days. The large engagements of gold for import, amounting to about $30,000,000; the continued heavy export movement of grain and other products; the unusual activity of home trade, and the splendid showing of railway earnings are all for the moment overshadowed by the absorbing factor of a possible appeal to arms. Meanwhile the situation, outside of the "war scare," is in every way encouraging. The movement of merchandise is growing as the season advances, the volume of bank clearings showing a gain of about one-third over last year's figures. In the West and Southwest a very large and satisfactory trade is reported, although transportation has been temporarily impeded by blizzards. The East, however, seems to be more affected by the prospect of foreign complications and is less forward than the other sections of the country. The iron and steel industry is very busily employed and large orders are being placed right along, while prices of Bessemer pig, gray forge and charcoal iron are all slightly higher. The consolidation of the Western wire rod interests, which is practically completed, tends to firmness in the lines affected. The metals are all firm, copper conspicuously so, but the volume of business in this department has been hardly as great as last week. Money continues cheap and the reserves of the banks are again mounting up. Collections are referred to as generally satisfactory.

Permanent Exposition of Manufactures in Peru.

On March 20 there was opened at Lima, Peru, under the auspices of the Government, a permanent exposition of manufactured articles designed to exhibit the latest improvements in machinery for agricultural, mining and manufacturing purposes, such as may be suitable for use in Peru. The exposition will also embrace all kinds of novelties for domestic use, also for water service, lighting, transportation, or, in fact, any new inventions or devices applicable to the country. The exhibitors are allowed space free of all charges, and all goods imported for the exposition and which are not sold after being exhibited will be transported to Callao gratis. It is reported that the European manufacturers have already availed themselves freely of this opportunity for increasing their trade in Peru, and in order that the United States may also share in its benefits Frederick Bergmann, Peruvian Consul-General in New York City, has announced that he will forward, free of charge, to Lima any small packages that manufacturers or merchants may desire to send for exhibition. Mr. Bergmann, whose address is 15 Whitehall street, New York, is also ready to furnish manufacturers with all information regarding the enterprise.

Activity Among Iron Founders.

A most encouraging feature of present business conditions is the increasing activity of foundrymen. Although every one connected with the iron trade has for a long time been apt to consider his own line as most seriously overdone, yet the foundrymen have perhaps had the hardest struggle to make both ends meet. That they have often not met is shown by numerous vacant jobbing foundries scattered all over the country. But for some months the tide has been rising in this as well as in other branches of the iron business. Foundrymen have learned that they were not wholly forgotten, and their services have been more and more in demand as the country wakened up to general industrial activity. The pipe foundries are not so well employed as they might be, but they are about the only class really suffering for lack of work. On the other hand, the malleable foundries are the most rushed, the demand for malleable castings being unprecedented. The makers of all kinds of specialties are also crowded, while the jobbing foundries everywhere are well employed. For the first time in years a considerable expansion of founders' facilities is being made. Idle foundries are being leased, or additions are being made to old works, while new undertakings are projected.

The foundry is such a universal expression of the iron trade, a more or less pretentious molding shop being found in even the smallest towns, that much significance can safely be attached to the increasing demand for its products. When the little foundries get busy, it means the widespread prevalence of prosperous conditions. Stinting economy has given way to something like generous indulgence. Repairs are being made to machinery, farmers are undertaking

improvements, manufacturers and merchants are stocking up more liberally, and the foundryman comes in for his share of the general improvement.

Manufacturers of foundry pig iron have excellent reason to feel hopeful over the reports which they are now receiving from their customers. The demand for such iron has for some time been less than the supply, and prices have therefore drooped. But unless the reports are wholly misleading, and the consumption is much below what it is represented to be, the time is near at hand when the output of foundry iron will not more than meet the requirements of the foundry trade. —*The Iron Age.*

International Sanitary Convention.

The International Sanitary Convention will be held at Detroit, August 9, 10 and 11. It combines the annual conference of State and provincial Boards of Health of North America and the quarter-centennial celebration of the organization of the Michigan State Board of Health. It is expected that between 300 and 400 delegates will be present. Nearly every State will be represented, as well as Canada and Mexico.

The officers of the sanitary conference are: President, Benjamin Lee, A.M., M.D., Philadelphia; secretary, J. N. Hurty, M.D., Indianapolis; treasurer, Eleazar Pelletier, M.D., Montreal. The officers of the Michigan State Board of Health are: President, Hon. Frank Wells, Lansing; secretary, Henry B Baker, A.M., M.D., Lansing.

The Detroit Citizens' General Executive Committee of Arrangements is as follows: Chairman, Henry A. Haigh, Hammond Building, Detroit; secretary, Dr. E. S. Sherrill, 270 Woodward avenue; George H. Russel, Dr. H. O. Walker, Levi L. Barbour, Dr. Leartus Connor, Dr. J. E. Emerson, Dr. Heneage Gibbes, George H. Barbour, Dr. J. H. Carstens, Dr. H. W. Longyear, Howard M. Holmes, Dr. C. W. Hitchcock, O. A. Bierce, A. A. Schantz.

Reception Committee.—Hon. Hazen S. Pingree, Hon. William C. Maybury, Dr. and Mrs. Leartus Connor, Dr. and Mrs. J. E. Emerson, Charles Buncher, Mr. and Mrs. George A. Steel, Dr. and Mrs. H. W. Longyear, Dr. and Mrs. W. P. Manton, Dr. Ben. B. Brodie, Dr. and Mrs. E. T. Tappey, Dr. C. T. McClintock, Dr. and Mrs. Geo. E. Frothingham, Dr. and Mrs. J. K. Gailey, Mr. and Mrs. H. C. Parke, Mr. and Mrs. F. K. Stearns, Mr. and Mrs L. L. Barbour, Mr. and Mrs. R. H. Fyfe.

Finance Committee.—George H Russel, Dr. H. O. Walker, C. B. Hubbard, Dr. J. H. Carstens, Bryant Walker.

Entertainment Committee. — Dr. Leartus Connor, George H. Barbour, Dr. H. O. Walker.

Gold from the Sea.

Some time ago it was announced that a company had been formed for the purpose of extracting the gold which it is claimed exists in solution in the waters of the sea. The idea was generally received at the time with more or less levity by the public and placed in the category of the Keely motor and other equally fantastic discoveries. Nevertheless the projectors went ahead, and, under the name of the Electrolytic Marine Salts Company, built extraction works at North Lubec, on the coast of Maine. This week the Government Assay office in New York City received the first consignment of precious metal alleged to have been produced there from sea water. The assay of the ingots received, which weighed 92.2 ounces, showed 0.317½ of gold, 0.634 of silver and the rest base metal. The gold contained in them was found to be worth $599.61, and the silver worth, at the present market price, $32.19. How much capital was expended in securing this return is not stated, nor what amount of time and labor. But if the metal sent to New York from North Lubec is what it claims to be, the product of sea water—and the genuineness of its origin does not appear to be doubted—the original proposition of the projectors of the scheme seems to be proved. It is on record that the assayer of the mint at San Francisco, Cal., some years ago experimented with sea water taken from the bay, and found that a ton of water yielded 4 cents' worth of gold. Thus it would have required the treatment of nearly 15,000 tons of water to furnish the North Lubec gold. At this rate there is no reason to expect that the ocean will prove a serious competitor to the Klondike at present.

A demand is reported to be growing up in England for American slate mantels, which are said to be meeting with considerable favor on the other side.

The Boston Mechanics' Exhibition.

The Massachusetts Charitable Mechanic Association of Boston has issued the prospectus of the twentieth annual exhibition, which is to be held in October and November of this year.

The association was organized in 1795, by master mechanics of "the town of Boston." Paul Revere, the famous Revolutionary patriot, was its first president. With the passing years it grew in numbers and influence, and improved in its methods of work. In 1812 it commenced its charitable work, which still continues. In 1818 it gave its first prize for mechanical excellence, followed for some years by awards for sundry mechanical works, but it was not until 1837 that it commenced holding exhibitions of industry, skill and art with regularity. Since that time they have been held triennially, increasing in importance and popularity with both exhibitors and visitors. For many years they were held in the hall over Quincy Market, which was in time outgrown, and in 1881 land was purchased and the present building erected. The lot covers 110,000 square feet, and the building occupies nearly the entire area. In the basement, which is high, dry and light, are located the boilers, engines, dynamos and other machinery, with long lines of heavy overhead shafting. The building is divided into three sections. That at the corner of Huntington avenue and West Newton street is known as Grand Hall, with a floor surface of 150 x 200 feet, with two balconies. This is the largest hall in New England and is occupied for all the largest meetings held in this city. The center section is known as Exhibition Hall, covering 40,000 square feet. On the balcony floor is Paul Revere Hall, 50 x 90 feet, with spacious adjoining apartments, besides Talbot Hall, the kitchen, &c. In the Administration section are located Russell Hall and the offices of the association.

The Board of Government consists of Horace T. Rockwell, president; Horace H. Watson, vice-president; Newton Talbot, treasurer; Alfred Bicknell, secretary, and the following trustees: Samuel N. Davenport, John F. Buerkel, Edward F. Porter, Henry A. Turner, Henry C. Whitcomb, Ottomar Wallburg, Charles H. Morse, Henry Hall, William L. Miller, Henry D. Dupee, John Evans and James H. Roberts.

The rules provide that the building will be open for the reception of exhibits from September 12 to October 8, the exhibition opening on October 10. Each exhibitor is required to pay an entrance fee according to the location and character of the exhibit, the minimum being $5. Power to drive machinery is furnished free, the speed of the main line of shafting being 200. The arrangement at the exhibition has been placed in the hands of an Executive Committee consisting of Horace H. Watson, chairman; Samuel N. Davenport, treasurer, and Henry D. Dupee, secretary.

The World's Spelter Production.

We are indebted to the American Metal Company for the report of the production of spelter in the world, compiled annually by Henry R Merton & Co. of London. For the past three years the output in Europe and America has been as follows:

The World's Production of Spelter.

	Gross tons.		
	1897.	1896.	1895.
Rhine, Belgium and Holland	184,455	179,730	172,135
Silesia	94,045	95,875	94,015
Great Britain	23,430	24,880	29,495
France and Spain	32,120	28,450	22,895
Austria	8,185	9,255	8,355
Poland	5,760	6,165	4 960
Total Europe	347,995	344,355	331,855
United States	88,207	73,105	78,206
	436,202	417,460	410,061

The figures for the United States are those collected by the American Metal Company.

In 1887 the production of Europe was 257,155 tons, while that of this country was 45,530 tons. The United States has therefore developed as a producer more rapidly than Europe.

The Bay State Aluminum Company, Quincy, Mass., have received a large order from the Simms-Dudley Defense Company of New York for aluminum caps and steering gear for shells for the 30 dynamite guns ordered by the Government from the last named concern.

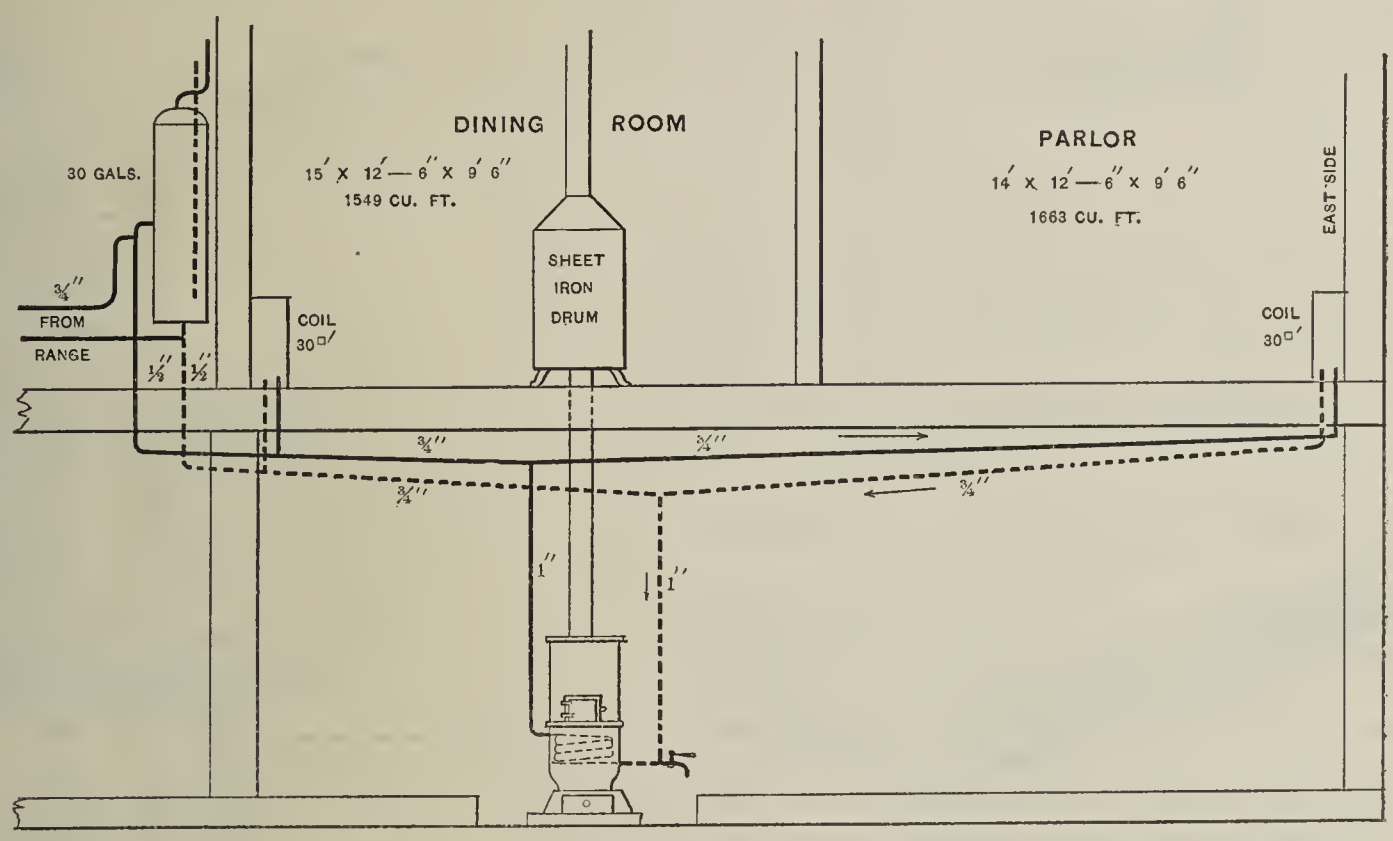
The United States Senate on Monday passed a bill authorizing the construction of eight new revenue cutters, not exceeding in aggregate cost the sum of $2,025,000.

The recent mild weather is reported to have started the breaking up of the logging camps in the State of Wisconsin at the earliest date for many years past.

THE LETTER BOX.

Heating from Stove Coil.

From G. A. L., Hamilton, Ontario.—Will you kindly give me through the columns of *The Metal Worker* some assistance with the following problem? I want to do away with the base burner stove which I have used for heating the front part of my house and which has been located in the dining room. I desire to adopt in its place some method of heating from the cellar. Being in the plumbing business, I have decided on a plan of heating with hot water if feasible, as I think it would be the most satisfactory and to me the least costly. I submit herewith a sketch of what I intend to do. Our house is a small one, the contents of the two rooms to be heated being only 3202 cubic feet. The parlor room faces the east and is 14 x 12½ x 9½ feet, and the sitting room, immediately beyond it, is 13 x 12½ x 9½ feet. To heat these two rooms I intend placing a coil in each under the window, as shown. The coils are to contain 150 feet of 1-inch pipe and will present about 50 feet of surface in each case. The supply and return pipe to each coil will be ¾-inch pipe. The coil to be placed in the stove will be made of 1-inch pipe, running around on the inside of the fire pot in such a position that when in use it will be buried in the fire. The stove I intend to use is one of the kind known as globe heaters, having a fire pot 14 inches in diameter and 14 inches deep, with a grate 11½ inches in diameter. The combustion chamber above is 14 inches in diameter and 18 inches high. To supply the system with water and to use the apparatus partially for heating the water in the range boiler I intend to make the range boiler a part of the system and the source of supply. To prevent too much hot water passing into the range boiler, which will be a little higher than the coils, I intend to connect it with ½-inch pipe with the main and return which supplies the dining room coil. I also intend placing a ⅜-inch safety valve on the hot water pipe at the kitchen sink as a safeguard against explosion should the cold water supply to the boiler be shut off at any time. To supplement the heating coil I intend to carry the stove pipe up through the dining room floor and connect it with a drum 2 feet in diameter and 3 feet 6 inches high, and carry the pipe from the drum to the chimney in the dining room. The kitchen boiler will be connected with the range in the usual way. The boiler is supplied from the city mains and carries an average pressure of 40 pounds to the square inch, although when the stand pipe pressure is put on for fire purposes the pressure is raised to 80 pounds. I want to know what amount of 1-inch pipe will be necessary to place in the stove to give satisfactory results if I connect the apparatus as shown, or can you give a rule generally for figuring the relative value of the heating surface exposed by a coil as compared with boiler surface in similar cases?



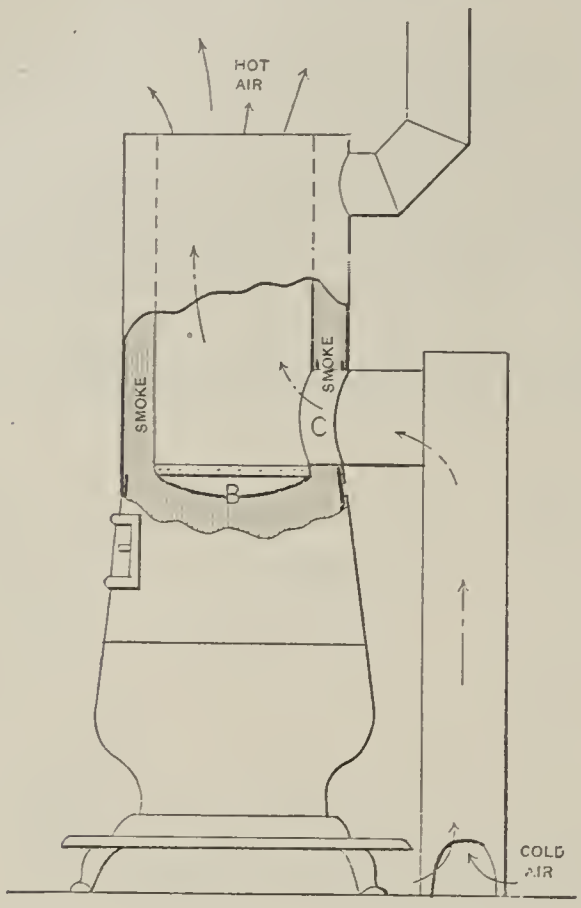
Heating from Stove Coil.

Answer.—With the assistance of the drum the amount of surface exposed by the coils will be sufficient for heating the space. The arrangement of the piping will permit a satisfactory circulation. It is quite possible that a 1¼-inch pipe for the main flow and return, and 1-inch branches from it would give better results than to use the small pipe proposed, which might, however, afford satisfactory results, as the system will circulate under a pressure. The size of the heating coil is regulated by the amount of work that it has to perform and the condition of the fire against it. In the piping and the radiating coils about 70 square feet of surface is exposed, and if the heating coil was expected to carry only the piping and the radiation it is quite possible that 11 lineal feet, or about 3½ square feet of heating surface, would answer the purpose, assuming that 1 square foot of heating surface under these conditions would heat only 20 square feet of radiation. When a coil is exposed over a clear fire so that ashes are not banked against it and the fire is kept in bright condition it has been found in a hot air furnace that 1 square foot of surface in the coil will carry 30 or more feet of radiation, but as the surface of the coil will sometimes be in contact with ashes, we have calculated that in this instance 1 foot would only be able to take care of 20 feet of surface. It has been found by experience that 1 square foot of surface in a coil will heat about half as many gallons of water as it will carry square feet of radiation, so that if 1 square foot will take care of 20 feet of radiation in the coil proposed

it would be equal to only about 10 gallons of water, and if it is desirable to make provision for heating water to this extent it means simply to add 3 more lineal feet to the heating coil. Our correspondent will find articles in *The Metal Worker* of February 9 and May 25, 1895, giving information on heating from coils in heating apparatus.

Heating Attachment for Soft Coal Stoves.

From J. F. T., Meadville, Pa.—I submit herewith some sketches of an attachment I am using on a heavy cast iron soft coal stove, and by its use I think I am more



Heating Attachment for Soft Coal Stoves.—Fig. 1.—Showing the Heating Drum.

than doubling the amount of heat that I would get from the stove without it. It will be seen from Fig. 1 that I have made a sheet iron cylinder, which on my stove is about two sheets high, and placed it on the center ring or section of the stove. Then I have made another cylinder which is placed inside of the first cylinder and of a sufficiently smaller diameter to afford ample flue space for the smoke travel between the two. The inner cylinder is of the same hight or length as the outside cylinder. The inner cylinder has a cast iron bottom, as shown at B. I make a 10-inch hole, or, rather, run a 10-inch pipe, through the two cylinders at C to admit air into the inside cylinder. To this pipe I connect a square or flat pipe of the



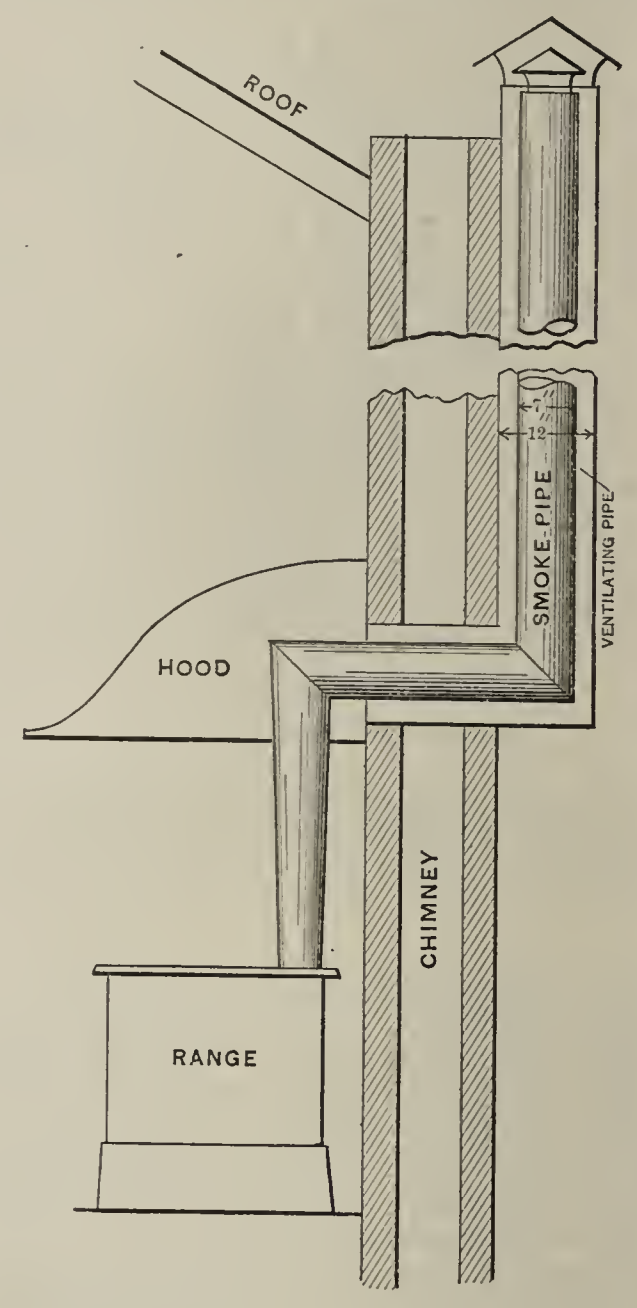
Fig. 2.—Collar Pattern.

same capacity as the 10-inch opening at C and extend it down to the floor at the base of the stove, so as to take the cold air from the floor and convey it into the inner cylinder and then discharge it highly heated at the top of the stove. The flat pipe should have a sufficient opening at the floor to admit air freely. The inner cylinder should be built of heavy iron, not lighter than No. 18. The smoke pipe or collar should not be less than 7 inches in diameter when soft coal is used. I have used this attachment on an ordinary oak stove also and found that it increased the amount of heat almost double. The stove may be finished with an ornamental top of any approved style if appearances require it.

I feel certain that if any of the readers of *The Metal Worker* will go to the trouble of putting this attachment on their stoves they will find that they are amply repaid for their labor, as in my experience it has proven itself a wonderful heater. If such a stove is used for storerooms or halls the hight of the cylinders is not an objectionable feature. The hight, however, can be made to suit the fancy of the maker, but, as a matter of fact, the higher the cylinder the greater the amount of radiating surface presented. The most difficult part of the work is making a tight connection where the 10-inch pipe passes through the two cylinders at C. This is made of No. 18 iron in two pieces, so that one will slip inside the other. On each piece of pipe a collar is made, somewhat after the shape shown in Fig. 2, and a flange turned off all around. These flange collars are riveted to the two pieces of pipe so that they fit tightly up against the sheet iron cylinder and enable a tight connection to be effected. Any tinsmith who has been in the habit of making tee joints will understand how to cut this collar. Should this meet the eye of any fellow craftsman who tries it and realizes the benefit that can be derived from its use I hope that he will report his success through the columns of *The Metal Worker*.

Removing Odors from Kitchens.

From C. W., Memphis, Tenn.—Being a subscriber to *The Metal Worker* I take the liberty of asking some help in solving a problem that is giving me some trouble. I



Removing Odors from Kitchens.

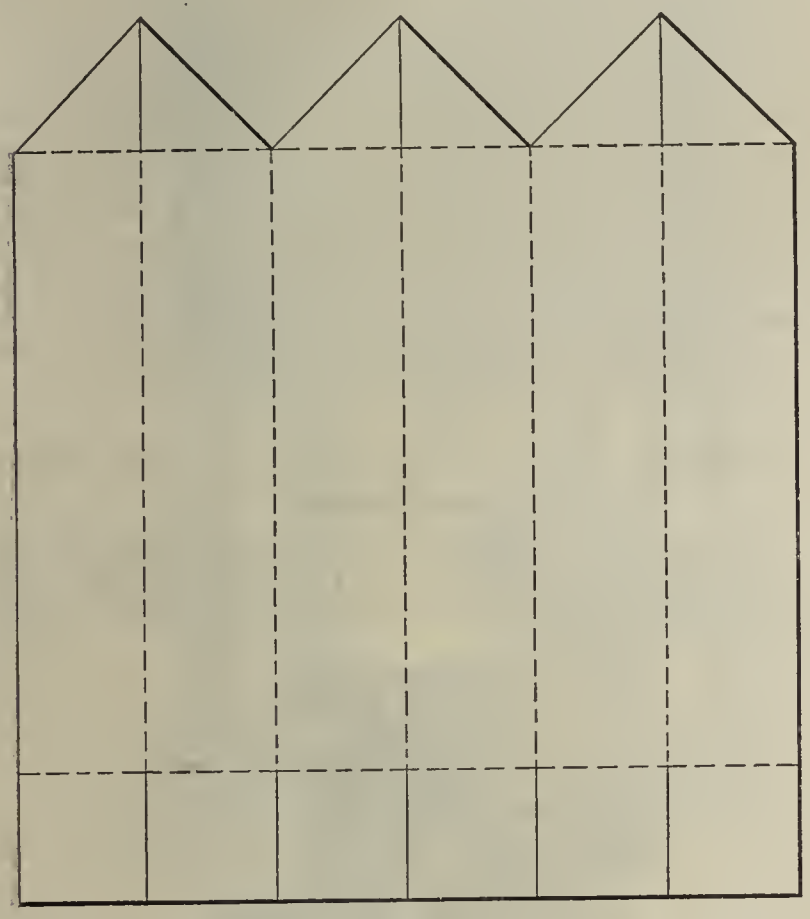
desire to know how to take the odors of cooking out of kitchens. I have tried several different arrangements but they have all failed. In one case I put a galvanized iron hood over a small kitchen range and ran a 12-inch ventilating pipe through the chimney and outside of the chimney, as shown in the sketch presented herewith, above the top of the chimney at the roof. Through the 12-inch ventilating pipe I ran a 7-inch smoke pipe, as shown. The ventilating pipe was 25 feet high, but it failed to work. If any of the readers of *The Metal Worker* can give any information that will enable me to take the odor out of the kitchen I will be grateful for it.

Note.—We hope our readers will come to the assistance of this inquirer. It would seem that success should have

followed his efforts to secure a current of air from the kitchen which would have carried off the odors. It is quite possible that the hood over the range was not as large as it should have been. The hood should extend at least 6 inches beyond the range on all sides and should not have been more than 7 feet from the floor. The connection with the hood should have been made at the highest point possible under it. The hood must have some assistance from the cook in cleanly utensils and effort to prevent the odors. It is difficult to carry off all of the odor of some foods.

Sheet Iron Molds for Lead or Solder.

From Warwick, Peterboro, N. H.—Since reading the article on fire proof roofs by William Neubecker in *The Metal Worker* of February 26 I have thought about the



Sheet Iron Molds for Lead or Solder.—Fig. 1.—*Pattern for Triangular Mold.*

trough or die illustrated in Fig. 37, of which he says: "Care should be taken to place a number of these pans between strips of wood to keep them from twisting." Now in my time I have seen fellows fussing with something or other in which to pour melted solder or lead so as to have it in strips. Inclosed you will find two paper models, which if made up in sheet iron will save bothering with sticks of wood. The model shown in Fig. 1 and 2 is probably older than I am, and I cannot remember when it was, in my 30 years of metal work, that I first

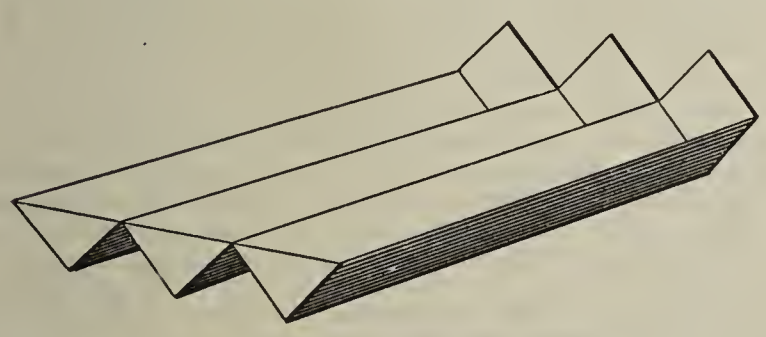


Fig. 2.—*General View of Triangular Mold.*

saw the mold which it represents. Though it is so old, yet I know there are lots of tinners who have not "caught on to it," so I send it to you thinking that perhaps you may consider it worth while to call the attention of some of the younger members of the craft to a simple and easy way of making a mold to run a bar of solder in when melting the scrap.

The mold shown in Figs. 3 and 4 is an improvement on Fig. 1 called forth by reading the article of Mr. Neubecker. I have formed one in sheet iron, and there is but little trouble in doing it. By having six or eight molds formed out of one piece they will warp or twist but little, and by placing a brick or something of moderate weight

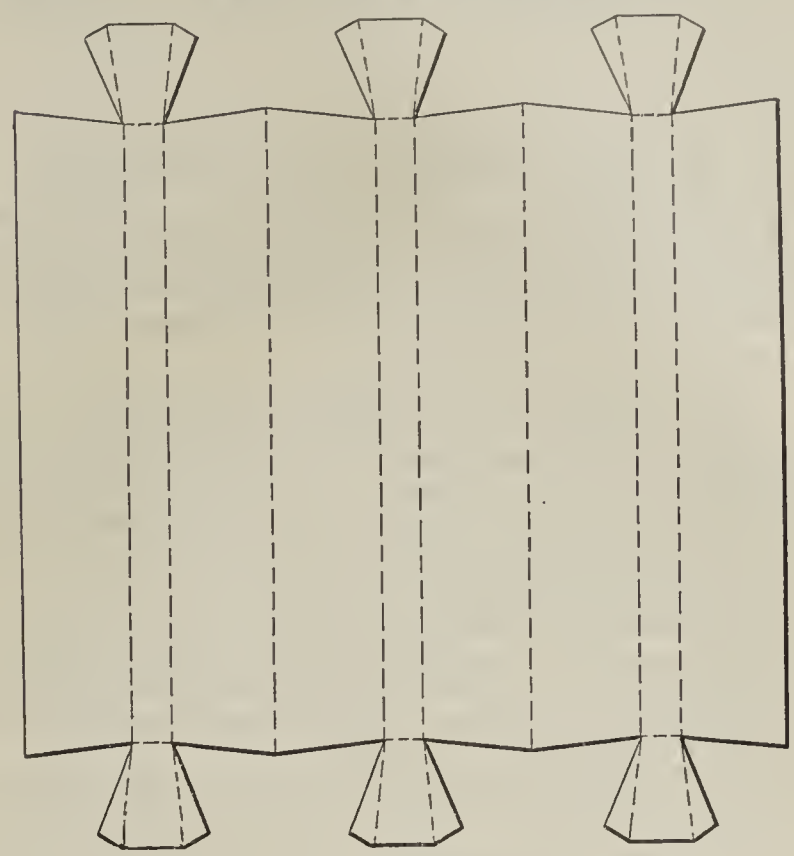


Fig. 3.—*Pattern for Square Mold.*

across the molds they will keep in shape even in 26-gauge iron. This I know because I have used a 26-gauge mold for a number of years for occasional use, the mold being made as shown in Figs. 1 and 2. The mold I use is not riveted at the ends, neither are the corners cut off, but merely bent to shape and allowed to remain so. No

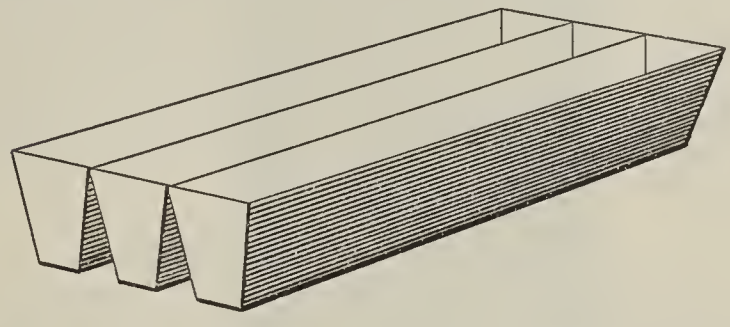


Fig. 4.—*General View of Square Mold.*

doubt it would be better to rivet the ends if using very often. Metal workers must do as other people do—that is, use their own judgment.

How to Make a Fountain Jet.

From Apache, Fort Grant, Ariz.—I have a fountain jet to make for a circular fountain about 100 feet in diameter and will be glad if some of your readers will give me an idea how to proceed.

Wanted Design for Advertising Lamp.

From W. H. R., Iola, Kan.—I want to make a street lamp for a drug firm here, to be set on top of a post and to be lighted by gas. I want it to be neat and ornamental in design, and to serve as an advertisement of my shop. Will some of the readers give me their ideas through the paper? Also can any one tell me how to make an American eagle out of metal?

Finial for Octagon Tower.

From Y. T., Chicago, Ill.—Please tell me how to strike out the pattern for a finial for an octagon tower.

Note.—If our correspondent will consult Problem 21 of the "New Metal Worker Pattern Book," he will find there the pattern for a pedestal which covers the same principles as are involved in the question he asks.

HEATING AND PLUMBING.

Plumbers' Apprentices and Trade Schools.

The Committee on Apprenticeship of the New York State Association of Master Plumbers, composed of Wm. F. Quinn, James J. Horan, Wm. Ferguson, James Temple and John J. Britt, made the following report at the annual convention at Binghamton :

Your Apprenticeship Committee beg leave to report that they have met and talked over the apprenticeship question, but at present have not arrived at any definite understanding or conclusion on the subject whereby they would be justified in presenting any resolutions to this convention for action thereon. They feel that it is a question of vital importance to the master plumber and one that should be handled with care.

The committee feel that the local associations are the proper parties to handle the question in their respective localities. However, the committee have a suggestion to make to the convention, or to the representatives of the different locals present, as follows :

That an apprentice must first serve at least two years under a master plumber before he shall be permitted to enter a trade school. If after serving two years with a master plumber he wishes to enter a trade school for a period of six months he can do so, with the understanding that at the expiration of the said six months he shall return to his former employer, providing the said employer so wishes it, and remain with said employer for the balance of a term—such term can be defined or arranged between the said apprentice and master plumber, or the local association can arrange the same, providing both parties so elect—and it is further suggested that the convention in considering this matter, and if the representatives think well of the foregoing suggestion, that some arangement should be made between the different trade schools, to the end that their applicants for tuition should have first served the required two years with the master plumbers before they are allowed to enter such school, and lastly that an apprentice should be possessed of a common school education, viz.,—that he can read and write the English language and shall be fairly advanced in mathematics.

Arkansas Master Plumbers.

The annual convention of the Arkansas State Association of Master Plumbers was held at Pine Bluff, March 14, and was called to order by President B. J. Dunn. After transacting the regular business the following officers were elected :

President, B. J. Dunn, Fort Smith.

Vice-President, Adam K. Robinson, Pine Bluff.

Secretary, J. M. Dungan, Little Rock.

Treasurer, A. A. Mandlebaum, Little Rock.

Sergeant-at-Arms, E. Thomas, Fort Smith.

Executive Committee, N. Peay, Little Rock ; E. Thomas, Fort Smith, and M. B. Saunders, Little Rock.

Delegates to National Convention, B. J. Dunn and J. M. Dungan.

Sanitary Ware Litigation.

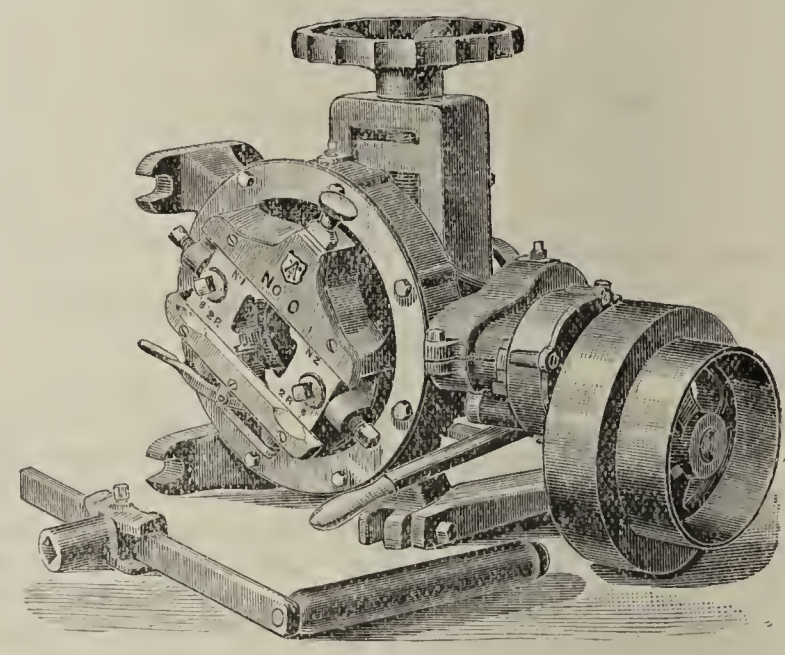
In a suit brought by the Trenton Potteries Company of Trenton, N. J., against the Oliphants to restrain the latter from re-engaging in the business of manufacturing sanitary pottery, Vice-Chancellor Grey of New Jersey filed last week an opinion dismissing the suit on the ground that the agreement sought to be enforced by the Trenton Potteries Company was in restraint of trade and otherwise illegal, and therefore could not be enforced. The Trenton Potteries Company, formed in January, 1891, bought five sanitary ware potteries in Trenton, N. J., one in Tiffin, Ohio, and one in Baltimore, Md.. All of them signed an agreement that for 50 years they would not engage in the pottery business in the United States, except in Nevada or Arizona. The Oliphants, owners of the Delaware Pottery of Trenton, received payment partly in cash and partly in stock of the Trenton Potteries Company. After a time the Oliphants became dissatisfied with the management of the Trenton Potteries Company and started the Bellmark Pottery in Trenton. The Potteries Company sought an injunction.

The suit was begun three years ago on the ground that the Oliphants had violated their agreement, and the defendants set up a claim that the agreement was in restraint of trade and therefore invalid. After hanging fire for a considerable time, the suit, on reargument, has been dismissed with costs, the Vice-Chancellor, in his opinion, saying that it is against the interest of the public that a man may be permitted to bargain away his right to earn a living and also deprive the community of the benefit it should derive from exercise of his energy and skill in business. The clause limiting the Oliphants to Nevada and Arizona to conduct the pottery business might as well have read " Within the borders of Lake Michigan and the Great Salt Lake," as coal, water and labor are as available there as in Nevada and Arizona. They were chosen simply to appear to avoid the operations of the law which makes invalid covenants in general as to space, and at the same time actually to prohibit the defendants from competing with the complainants in the United States.

The Trenton Potteries Company, it is reported, will carry the case to the Court of Appeals.

Armstrong's No. 0 Pipe Machine with Power Attachment.

The merit of the No. 0 new hand pipe threading machine, the latest addition of the Armstrong Mfg. Company to their large line of improved pipe machines, and



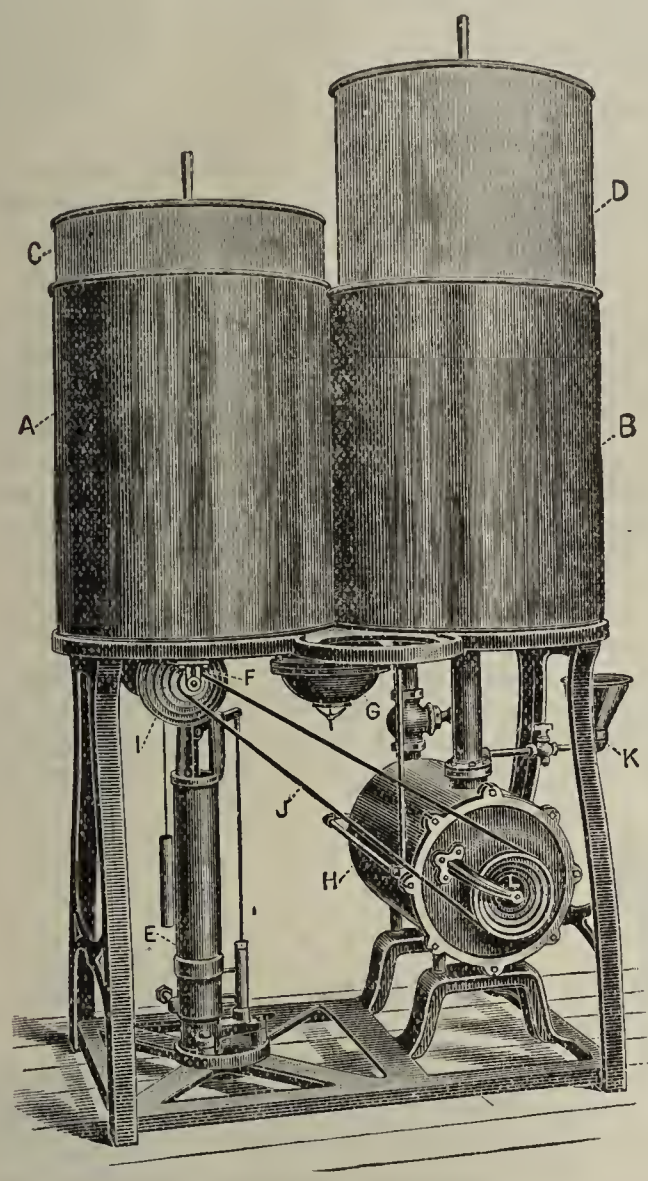
Armstrong's No 0 Pipe Machine with Power Attachment.

now in general use by the trade, has created a demand from mills and factories for the same machine to be run by power. To meet the market the Armstrong Mfg. Company have lately brought out an attachment which can easily be fitted to the machine and turns it at once into a power machine. This attachment is composed of an extra gear and pinion with two cone pulleys, which is slipped on the pinion of the second speed and has a stay bolted on the base to support it, making it perfectly strong. The engraving shows the machine with attachment ready for the belt. The No. 0 machine is made for threading pipe ⅛ to 2 inches and bolts from ½ inch up to 1½ inches. The working parts are all incased so as to keep them free from chips and dust. The gear of the die head does not bear on the head when revolving, and therefore does not wear loose by friction. This is considered by the manufacturers the very latest improvement on threading machines, and makes it impossible for the operator to produce a " drunken " thread. There are other features original in this machine which will be appreciated. Full particulars can be obtained by addressing the manufacturers either at Bridgeport, Conn., or 139 Centre street, New York City.

William D. Grady, a well-known plumber, formerly with J. F. Mulvey, has opened a shop at 138 Arnold street, Woonsocket, R. I.

The Gasoleum Machine.

The trade will be interested in the accompanying illustration and description of the Gasoleum machine for lighting and heating, manufactured by the Johnson Electric Service Company, Milwaukee, Wis. In the cut A and B are light galvanized steel cylinders closed at the bottom and open at the top, while C and D are open at the bottom and closed at the top, slipping down inside of A and B with their lower edges in the water. If filled with air they do not sink, but are in the position of D in the cut, the



The Gasoleum Machine

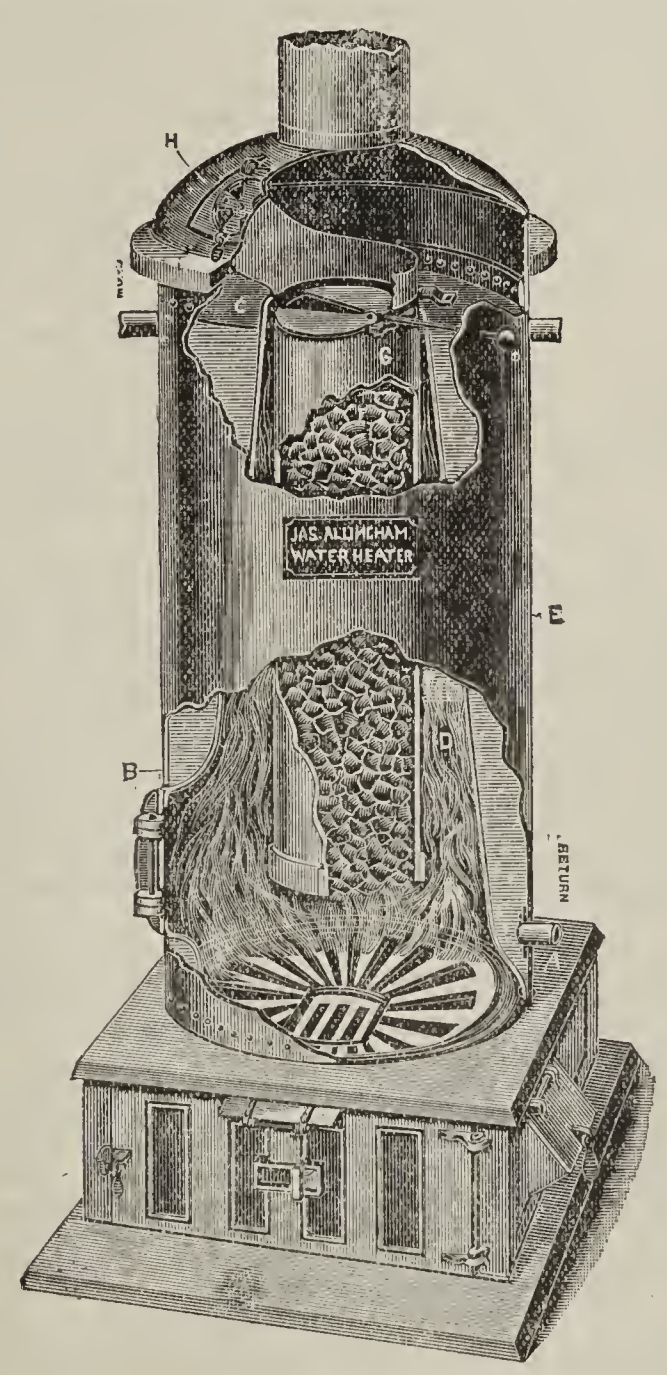
external and internal cylinders forming an air pump, G being the inlet valve, through which the air is sucked in. The air passes from D down through the vertical pipe, which enters the drum H as shown. E is a water cylinder with a piston. When water under pressure is admitted below the piston in E it pushes up the rod connected with C, raising the chamber C, and lets in air at G. When C is raised to the proper hight the water valve mechanism is reversed and the water which pushed up the piston in E is allowed to escape, the piston falling and leaving the chamber C suspended above the water with its contained air. C is more or less weighted so that it produces a pressure upon the contained air, and being in communication with D it is evident that unless D is as heavy or heavier than C it will rise in the water. This will occasion C to fall, and when it has reached its lowest limit the water pressure is again admitted to E and C forced upward. When C starts to move up D will begin to fill slightly and keep up the pressure of air. This pressure of air is very small, but it must remain constant in order to give steady light. Within the same casing with the inlet valve is another valve in the pipe between C and D, which prevents air which has once entered D from escaping back into C. Consequently all air which has been sucked in at G must go forward in one direction, keeping up a continual supply.

The drum H is a carburetor, and by mechanism not shown in the cut the air comes in contact with the gasoline in such a manner as to properly combine the proportions of air and vapor to produce the gas. If much gas is used the cylinder C will fill rapidly and mechanical movements will take place rapidly, and a greater quantity of air be carbureted in proportion. If, on the other hand, one light is used, C will fall slowly, the cone I will turn slowly and the carbureting will take place slowly through the movement communicated by the belt J and so, it is pointed out, the gas produced will be equally rich whether one light or many are burning. The gasoline is fed automatically through a pipe at the opposite end of the carburetor H. The manufacturers state that at the usual water rates of 15 cents per hundred it will cost less than 1 cent to furnish the power to produce 1000 cubic feet of gas. The standard Gasoleum machine is arranged to be conected with a horizontal galvanized steel cylinder not more than 24 inches in diameter for holding the gasoline, this tank being placed in the ground outside of the building and connected with the machine by pipes. There is also a machine with a portable tank holding 5 gallons of gasoline, three cylinders being furnished, so that in recharging it is only necessary to put on a new cylinder.

The Gasoleum machines are made in various sizes to meet various requirements, the smallest machine, it is stated, easily doing the cooking and lighting for an ordinary family, and it is also sufficient for completely lighting one or more stores of ordinary size up to a capacity of 50 lights. The larger machines are adapted to 100, 200, 300, 500 and 1000 lights. For cooking purposes it is pointed out that a gas range of four holes absorbs the capacity of a gas machine equal to 20 lights. The space occupied by the smallest machine is 20 inches wide, 40 inches long and 6 feet high.

The James Allingham Hot Water Heater.

The Rockford Grate Company, 146 to 160 Bunker street, Chicago, are manufacturing the James Allingham hot water heater, which is herewith illustrated. A portion of the heater is represented as broken away, to permit the interior construction to be more readily understood. In their description of this heater the manufacturers say that it is constructed with a cone flue, but that, unlike other heaters built on that principle, it uses no cast iron in the dome, mud ring or door frame. The cone flue in the James Allingham heater is made of steel plate, flanged out at the bottom and at the door. This, together with the steel head, allows the flue to give, and thus all trouble caused by expansion is overcome. Breaking of the calk-



The James Allingham Hot Water Heater.

ing joints, drawing of the rivets and buckling of the cone are claimed to be unknown in this heater. The cone flue construction is extremely desirable, as it enables circulation to be effected almost as soon as fire is started, because only a small amount of water is to be heated at the point where the fire is hottest. The grate construction is such that the fire is always hottest at the outer edge or point of contact with the boiler in place of the center. The ash pit is large and the draft openings are arranged to insure perfect combustion and perfect regulation. This heater

is made in a wide range of sizes, the larger sizes being self feeders, but the small sizes are made without magazines. The company have issued a catalogue in which are found a number of very flattering testimonials, including an indorsement of the United States War Department.

SAN ANTONIO AND THE NATIONAL CONVENTION.

Those who intend to go to San Antonio, Texas, as delegates to the convention of the National Association of Master Plumbers, to open April 13, will be interested in the following letter and programme from Ed. Braden, Jr., of San Antonio, a member of the National Executive Committee, which gives information as to railroad and hotel rates and the arrangement of the business sessions and the entertainments:

"Regarding the programme of our local for the entertainment of the delegates during the convention week, ending April 16, I inclose you our programme, given below, which may be changed a little, but only in minor details. The railroads in the State of Texas have given a $5 rate for the 167-mile limit, and a 2-cent rate beyond that limit as a round trip fare. There will also be a one-fare rate all over the United States for this convention. Information as to how to reach San Antonio with as little difficulty as possible I cannot well give, as it will depend on localities and conditions. I will state, however, that accommodations can be secured in San Antonio from $1 up as high as you wish to go per day, on the American plan, or from 25 cents to $2, European plan. The Menger Hotel will be the headquarters of the National Association, rates $2.50 per day to $4, American plan. The Texas State Association will have its headquarters at the Southern Hotel, rates $2 per day. The Southern League at the Manchanke Hotel. You may say to all those attending this convention that all will be done by our little but energetic local to make their stay a memorable one, and especially ask the delegates to try to reach San Antonio on Tuesday evening, April 12, so as to take part in our local concert given by the Southern League of Master Plumbers (for the prevention of disease."

PROGRAMME FOR STATE, LEAGUE AND NATIONAL CONVENTIONS OF MASTER PLUMBERS, TO BE HELD AT SAN ANTONIO, TEXAS, DURING WEEK ENDING APRIL 16, 1898.

MONDAY, APRIL 11.—Texas Association called to order at 9 a.m., at Mission Garden Hall. Continue in session until business is completed. In the evening the delegates will be entertained at Scholz Palm Garden with vocal and instrumental music, recitations and refreshments.

TUESDAY, APRIL 12.—The third annual convention of the Southern League of Master Plumbers (for the prevention of disease) called to order at 9 a.m., at Beethoven Hall. Continue in session until business is transacted and labors for the fiscal year ending are completed. In the evening an entertainment will be given by the Southern League to the national delegates, their ladies and the public.

The programme will be varied and entertaining, consisting of short addresses from prominent master plumbers, musical numbers by local talent, with orchestra accompaniments, other interesting selections and a lecture by Albert E. Hyde.

WEDNESDAY, APRIL 13.—Delegates to the national convention will assemble at the Menger Hotel, national convention headquarters, with visiting plumbers and friends, at 9 a.m. sharp. A column will be formed, which, preceded by a military band, will march to Bethoven Hall, where President Thos. P. Culloton of Chicago will call the seventeenth annnual convention of master plumbers of the United States to order at 10 a.m.

ORDER OF OPENING.—Address by Gov. C. A. Culberson in behalf of Texas. Address by Mayor Bryan Callaghan in behalf of San Antonio. Address by President Braden in behalf of Southern League.

In the evening the San Antonio Local Association will take the delegates in charge and show them a few sights worth seeing. The ladies and their friends will hold a reception in the parlors of the Menger Hotel.

THURSDAY, APRIL 14.—Morning and afternoon session of the convention. For the ladies a carriage drive to the old Missions and other points of interest, with a stop at S. W. Park for refreshments. In the evening the delegates will be given a genuine Mexican supper at San Pedro Springs Park, with music by the band. The covering of their unique banquet hall will be Southern sky. The light of the stars, assisted by mundane illuminations.

FRIDAY, APRIL 15.—All visitors will meet at 9 a.m. on Alamo Plaza, for an excursion around the city and to Fort Sam Houston. At 11 a.m. the delegates and visitors are invited to attend a calisthenic drill to music at the United States Military Post, given in their honor by the commander of the post. There will be also a dress parade at sunset. After luncheon the delegates will probably hold their final session. In the evening a promenade concert will be the main feature, but there will be other features suited to the occasion and the temperament of the visitors.

SATURDAY, APRIL 16.—Plumbers' excursion to the City of Mexico, touching at the principal cities of the Republic. Train of Pullman buffet sleepers leaves San Antonio at 12.30 noon ; spend Sunday at Monterey. Ten days of sight seeing at a per capita cost of $40. The opportunity of a life time. Three days in the City of Mexico with an excursion to Vera Cruz if desired.

NOTE.—If lady visitors choose they will be given a trolley ride to the Alamo Heights on Wednesday afternoon and to West End on Thursday afternoon.

SCHOLZ PALM GARDEN.—A FAMILY RESORT.

The beautiful palm garden is situated on Alamo and Losoya streets, with ladies' entrances on both streets. This garden is the most popular ladies' and gentlemen's resort in Texas. Those desiring to spend a pleasant evening will find this the place to get a nice lunch and hear sweet music by one of the best string bands in the city. In visiting Scholz Palm Garden, you will run no risk of meeting with tough characters such as usually try to make places of amusement their headquarters.

The Universal Bath Seat.

Buffalo Specialty Mfg. Company, Buffalo, N. Y., are offering the bath seat herewith illustrated. The seat is of solid oak nicely finished, 19½ inches long and 5½ inches wide, with rounded edges and ends. The under side is

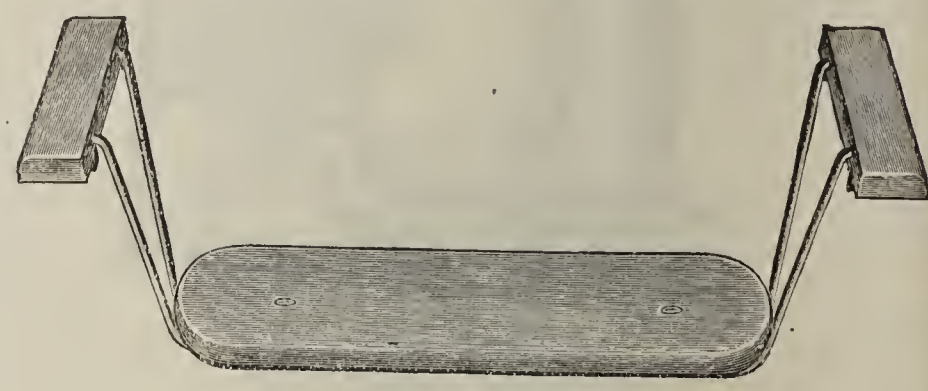


Fig. 1.—*The Universal Bath Seat.*

provided with a wide groove in which the ends of the brackets slide for adjustment to any size of tub. Each bracket is formed from one piece of tinned steel rod. They are held in position by a suitable casting and thumb nut, to insure strong and quick adjustment. The end pieces or rests are also of solid oak, with the under sides fitted with rubber strips to prevent marring the tub. The



Fig. 2.—*Bottom View of Bath Seat.*

device is referred to as light, strong, pleasing and ornamental. By the use of the seat, it is pointed out, foot-baths can be taken with ease and comfort, without disrobing, and that naturally seated while bathing the limbs and body can be readily and comfortably bathed and rubbed. It may be used by ladies as a head rest for keeping the hair from getting wet, and it is also useful when bathing children.

Fitters' Text Book.

The new edition of the Steam and Hot Water Fitters' Text Book, by Thomas E. McNeill, has just been issued. The fact that in so short a time it has been necessary to bring out a new edition of this work testifies strongly to its usefulness and popularity. The book, it will be remembered, is made up from articles published in *The Metal Worker*, and which were originally used as a course

of lectures in the steam and hot water fitting department of the New York Trade School. The instruction is given in the form of a text book by questions and answers, and carries the student along from the simplest information regarding tools and fittings up to the running of pipes, to the planning of different systems of heating by steam and hot water in the various different plans, while at the end is given information about estimating, drawing up specifications, &c. The book is a small volume of 140 pages, profusely illustrated, and can be furnished by the David Williams Company, 232-238 William street, New York City, price $1.

THE ILLINOIS STEAM FITTERS.

The Illinois Master Steam and Hot Water Fitters' Association held their fourth annual convention in Chicago on the 16th and 17th inst. The principal officers in charge of association affairs were as follows: President, T. B. Davis of Rock Island; secretary, E. C. Haas of Springfield; treasurer, John G. Roland of Chicago. The members present comprised the following:

Alton.—R. Garstang, P. J. Kane.

Bloomington.—Robert Loudon, George McIntosh.

Chicago.—R. H. Thomas, B. B. Maginn, W. D. Elwell, Thos. Hanley, Henry Mertz, Thos. J. Douglas, George Rood, Wm. Sullivan, J. L. Cook, E. M. Craig, George Dixon, F. W. Lamb, L. H. Prentice, W. E. Sloan, John J. Spear, John G. Roland, Thomas Kavanaugh.

Danville.—E. J. Ryan.

Joliet.—A. C. Dillman, E. C. Barrett, Robert Meers, George Poehner.

Lincoln.—H. Marshall.

Peoria.—J. P. Nailon, W. W. Murphy, Arthur J. Antcliff, John O'Neill, Jr.

Rock Island.—T. B. Davis.

Springfield.—E. C. Haas.

Quite a number of representatives of the craft were present from adjoining States, who had been invited to participate in the formation of an interstate league. They were formally given the courtesies of the floor.

The usual routine business was transacted, in addition to which resolutions were adopted declaring that after May 1 no bids or estimates would be submitted to general contractors, but only to owners or architects direct; that architects be requested to fix a time for opening bids, and that bidders be privileged to be present at that time, and that the bids be posted in the architects' office where all can see them; that manufacturers and jobbers of steam or hot water heating supplies refrain from making net prices or discounts from price-lists to persons not members of the Master Steam and Hot Water Fitters' Association; that manufacturers and jobbers of house heating boilers and radiators shall cease to make plans, specifications or estimates for construction work and guaranteeing or becoming responsible for construction work done by any master fitter; that a uniform contract be drawn for use by the master steam fitters of Illinois, and that steps should be taken to secure the repeal or amendment of the State lien law. The following officers were elected for the ensuing year:

President.—Thomas Kavanaugh, Chicago.

Vice-President.—A. C. Dillman, Joliet.

Secretary.—W. E. Sloan, Chicago.

Treasurer.—J. P. Nailon, Peoria.

Representative to Western League.—Henry Mertz.

Delegates to National Association.—Thos. B. Davis, Rock Island; R. Garstang, Alton; W. J. Hilliard, Elmhurst.

On Wednesday evening a banquet was given to the visitors and some other members of the trade by the Chicago Master Steam Fitters' Association, in the rooms of the Temple Club, Masonic Temple. Their hospitality was highly appreciated, and all present enjoyed themselves hugely.

WESTERN LEAGUE OF MASTER FITTERS.

During the recesses of the convention the Western League of Master Steam and Hot Water Fitters was launched by representatives of the trade from the States of Illinois, Wisconsin, Minnesota, Iowa, Missouri, Indiana and Michigan. The constitution of the Interstate League of Master Plumbers was adopted, with the necessary changes to make it applicable. Dues were made $1 per quarter. The membership will consist of three representatives from each State association, with three members of the trade to be invited from States having no organization. The following officers were elected:

President.—Henry Mertz, State and Kinzie streets, Chicago.

Vice-President.—Charles E. Hasey, Minneapolis.

Executive Committeeman.—H. P. Blair, South Bend.

Treasurer.—R. H. Thomas, Chicago.

Secretary.—T. F. Hanley, 9 Adams street, Chicago.

CONVENTION OF NATIONAL ASSOCIATION OF MASTER STEAM AND HOT WATER FITTERS.

On next Thursday afternoon the Executive Committee of the National Association of Master Steam and Hot Water Fitters will meet in their headquarters in the Wool Exchange Building, New York, for the purpose of selecting the time and place of holding the tenth annual convention. The affairs of the association have prospered in the hands of Secretary Henry B. Gombers, and visiting members are gratified with the promptness with which their business can be transacted through the systematic arrangement of the papers of the association and the classification of the various matters brought to its attention. The details of any matter are comprehensively presented to those seeking assistance or information as the result of exhaustive and careful classification made by the secretary. The effect has been a renewed interest in the association, and delegates to the next convention can report a pleasing state of affairs on their return to their locals.

THE BOILER MARKET.

The low price of house heating boilers has been the theme of discussion in the trade for a long time, and the latest cause for a revival of it is a rivalry in one of the large cities to see who can strike the lowest level. Those who have no interest in such a competition deplore the effect that the contest will have on the general market.

Boilers should be sold as an article of merit in accordance with the advantages they possess, and not as a lump of metal. The present trend, if followed to the end, will result in the consumer securing a waste of fuel and becoming disgusted with the boiler system of heating. Those who have searched find no evidence of a disposition on the part of boiler manufacturers to adopt a more business like method of selling their product than now prevails, yet there is a general conviction that the condition at present is very unsatisfactory and that it should not continue.

It is noted that while the cost of selling boilers is still too great, it is much less than in previous years. The period of introduction seems to have passed, and the buying is more natural. This is an improvement, and under it boilers should not deteriorate through unnatural competition, which seems most fierce on boilers rated less than 1000 feet, although not confined to them.

The Pierce, Butler & Pierce Mfg. Company's Show Room.

The rearrangement of the sample room of the Pierce, Butler & Pierce Mfg. Company, at 94 Centre street, New York, reflects credit on Manager F. T. Bassett, Jr. On entering the door at the left is a display of the Bremen and Reliance radiators, decorated in bronze, and along the left side are grouped samples of the Florida self feed and surface burning house heating boilers. On the opposite side of the show room samples of the Perfect and Spence hot water heaters are shown. Through the center of the show room are arranged samples of the Florida Junior steam and hot water heaters, as well as the Soleil steam heater, and at the rear a large size of the American vertical sectional boiler, adapted for both steam and hot water heating, is displayed. The company have recently issued a new discount sheet of their boilers and radiators, and

are preparing a new hand book for the trade. They are also bringing out a larger size of the Florida Junior boiler, which will have a capacity for carrying 475 feet of steam radiation and 600 feet of hot water radiation.

Chicago Delegates.

The delegates elected by the Chicago Master Plumbers' Association to represent that body at the national convention, to be held in April, at San Antonio, Texas, are as follows :

Alcock, C. W.
Alcock, J. R.
Bachtold, C. E.
Baggot, E.
Bain, L. R.
Barrett, M. F.
Baumgarten, C. F.
Bowden, Wm.
Boyd, C. J.
Boyd, T. C.
Breyer, C. C.
Breyer, Henry.
Brown, J. W.
Brunt, J. W.
Byrne, C. F.
Cannon, John.
Clark, J. J.
Coleman, R.
Connors, T. G.
Conway, Thomas.
Corboy, M. J.
Degnan, John.
Dempsey, Jack.
Denniston, J. A.
Deveney, J. H.
De War, D. F.
Donnelly, R. J.
Dornbos, Al.
Doyle, J. J.
Elliot, J. I.
Elwell, W. R.
Emblem, J. L.
Finn, R. B.
Foskett, C. M.
Gannon, John.
Geary, T. F.
Geary, W. T.
Gleason, J. J.
Hackett, Ed.
Hanley, Thos. F.
Hanson, Jos.
Heeney, J. P.
Herbert, C. J.
Hickey, A. C.
Hickey, D. J.
Hickey, J. C.
Hutchinson, B. Z.
Jaeshke, Paul.
Jesperson, C. H. C.
Kendrich, F. J.
Kurz, J F.
Larson, G. A.
Lear, R. H.
Manthie, Chas.
Martin, W. S.
Marubio, A.
Marwedel, A. E.
McDonald, M. C.
Molter, N. P.
Morris, W. J.
Mose, A. K.
Murphy, J. C.
Nacey, P.
O'Brien, J. P.
O'Malley, J. E.
O'Shea, Edw.
Page, F. W.
Powers, R. J.
Radcliffe, F. W.
Redieske, Paul.
Reilly, Jos
Roche, J. H.
Rock, D. J.
Ruh, Frank E.
Sanders, John.
Sanders, P.
Sawkins, J. O.
Scheuer, Jos.
Schmidt, Wm.
Scholefield, F. R.
Schweitzer, R. J.
Shuster, F. P.
Smillie, Wm.
Smith, J. B.
Smith, Samuel.
Stanley, Wm.
Thielen, P. J.
Thorogood, R.
Tierney, D. J.
Walsh, David.
Walsh, J. J.
Watson, A. H.
Weber, J. G
Whiteford, D.
Willems, Peter.
Wilson, David.
Zimmerman, H. R.

Quite a number of them will be accompanied by ladies.

A New Incandescent Gas Mantle.

An interesting modification of the ordinary incandescent gas mantle is being placed on the market by Huettlinger & Vivié of 101 Pearl street, New York, who are sole agents for export of the Safety Incandescent Mantle Company. Its special feature is that it is delivered to consumers in a pliable form, so that all danger of injury in packing and shipping and in the hands of consumers is avoided. When placed in position the mantle is lighted, and the gas is not turned on until the outside cover has been burned off. We understand that the manufacture is developing rapidly.

NOTES.

Irreconcilable conditions prevented the success of the recent efforts to organize the manufacturers of Radiators. The fruit of this failure is a notable weakness in the Radiator market. Houses which have heretofore held firmly to prices are now issuing, unsolicited, discount sheets showing lower prices than those which ruled during 1897, and there seems to be a disposition to find the bottom for prices. It is claimed that the smaller buyers who are out shopping are liable to secure goods for immediate use at lower rates than some of the larger buyers, who place confidence in the house with which they have traded and send their orders to be filled on old quotations. The prices for these goods are weak at a time when trade is notably slack, the latter part of March this year being conspicuous for the dullness of trade.

The strength of Wrought Iron Pipe, referred to in our last report, has not been maintained during the past week. Prices are a shade lower again. Otherwise there has been no special change in the situation as regards Plumbers' and Steam Fitters' Supplies. Brass Goods are very firm, with an advancing tendency.

Thomas Yeager & Co., Allentown, Pa., make a fine display of Plumbing Goods and Heating Apparatus to some purpose, they having done the plumbing and heating in many important buildings, among which are the Grand Central Hotel, Y. M. C. A. Building and the Salem and Trinity churches, besides setting 23 Hot Air Furnaces.

The Sieben Trap & Specialty Company of Kansas City, Mo., have filed articles of incorporation with Recorder Queal. The company have $3000 capital stock. The incorporators are Henry Sieben, the city Plumbing Inspector; Benjamin Smith, L. M. Smith and C. E. Burnham, City Attorney.

Mark Jacobs, formerly of Youngstown, Ohio, has formed a partnership with Robert Whitla of New Castle, Pa., to conduct a plumbing establishment in New Castle.

S. F. McCants and T. F. Carey, Spartansburg, S. C., have dissolved partnership in the Stove and gas fitting business. Mr. McCants now owns the business.

Daniel Hood has opened a plumbing establishment on Main street, Westfield, Mass.

Brown & Hinsdale have moved their plumbing shop from Whatcom, and are now located on Eleventh street, Fair Haven, Wash.

A. J. Erbelding, one of the leading plumbers of Augusta, Ga., who conducts a large business on Ellis street, has been awarded the contract for all plumbing work in the Court House at Jackson, Ga.

One item of the tax levy of Lynchburg, Va., reads as follows: On every plumber whose capital is less than $800, $15, and an additional tax of $1.50 on every $100 upon all capital in his business in excess of $800 and not in excess of $75,000.

Plumbers of Taunton, Mass., note that they have frequent calls to look over water services because the owners have heard from the water office that the meter shows an unusual consumption. Closets in which the valves are leaky and keep up a steady dribble are leading causes of the waste of water.

A. M. Michael of Toronto and C. M. Robertson of Montreal, Canada, wholesale dealers in Plumbers' Supplies, spent a few days last week in Pittsburgh arranging to purchase Plumbers' Supplies of all kinds.

The Master Plumbers' Association of Boston and vicinity held their annual dinner last Thursday evening with Inspector of Plumbing Hunnewell as their guest. After the banquet the following officers were elected for the ensuing year: President, T. W. Good: vice-president, D. J. Wild; secretary, H. L. Rose; treasurer, E. W. Clark.

The Dewstoe & Brainard Company of Cleveland, Ohio, have been incorporated, with $20,000, capital stock. The company will engage in the business of plumbing, gas and steam fitting, sewer building, &c. The incorporaters are C. C. Dewstoe, O. N. Brainard, Jr., G. G. Bennett, C. O. Dewstoe and W. B. Whiting.

Austin F. Lawrence is about to engage in the plumbing business in Weeks' Block, Falmouth, Mass.

Hugh Moriarty is building a store for his plumbing and Stove business, at South Manchester, Conn.

The Mexican Clay Mfg. Company have completed the installation of the Sewer Pipe machinery in their plant at Mexico City. The equipment was imported from the United States, and filled 12 cars. Already contracts have been obtained for large quantities of Pipe, one of them being for the sewer system of the city of Guadalajara. The company are composed of Ohio capitalists, with H. A. Robinson at their head as general manager of the works.

The Acetylene Generator Company have been incorporated at Chicago, Ill., with a capital of $50,000, to manufacture Gas Generators. The incorporators are H. W. Carter, A. H. Graves and Charles W. Beck.

The National Pipe Bending Company, New Haven, Conn., have recently sold the Boston Electric Light Company eight of the National Feed Water Heaters of 2250 horse-power each, aggregating 18.000 horse-power. This is probably as large an order for Heaters as has been given by any electric plant in the last year.

The Standard Turning Works, Boston, Mass., distribute as an advertising card a match scratcher, the upper part of which carries photographs of the interior of their works, showing the operations of sawing, turning and finishing. The company do all sorts of turning, including Plumbers' Supplies, such as Closet Pulls, &c.

John W. Hunt, who has been for 13 years in the employ of E. S. Hodge, at Peace Dale, R. I., has moved to Providence, where he has started a tinsmith and plumbing business.

W. C. Joy, 152 Centre street, manager of the New York office of the Titusville Iron Company, entertained President Fertig this week. Mr. Joy is drawing the attention of the heating trade to the line of Radiators made by the house by a new four-page folder which shows the Occident Radiator on the front page and the Zenith Radiator on the last page. The two inside pages contain a long list of notable buildings in which the Joy Radiators have been used, among which is the new Syndicate Building, which is to be 30 stories in hight and which is said to be the tallest building in the world. Buildings of conspicuous prominence are presented in a larger size of type, and buildings in which Joy Radiators are used, although other Radiators had previously been specified, are noted in italics

W. F. Gilling of the Boston office of the Pierce, Butler & Pierce Mfg. Company, Syracuse, N. Y., is making a very fine display of the Florida and other Steam and Hot Water House Heating Boilers made by the company, and also their Radiators. He was visited this week by Manager F. T. Bassett, Jr., of the New York house.

Max Berger of the Plumbers' Examining Board of Long Island City is about to embark for the Klondike.

Manager John I. Leitch, 206 Centre street, New York City, is displaying on his sample floor one of their Empire Radiators decorated in white enamel and gold bronze, which gives a very handsome effect. This is one of the latest productions of the Standard Radiator Mfg. Company of Buffalo, N. Y., and possesses much to attract the heating contractor and his customer.

Thomas Kinney will open a hardware and plumbing establishment on Main street, Plymouth, Pa.

Peterson Bros. and McGregor & Waddington, two plumbing firms at Bloomington, Ill., have dissolved partnership. Out of the dissolutions a new firm will appear, to be known as Peterson & Waddington.

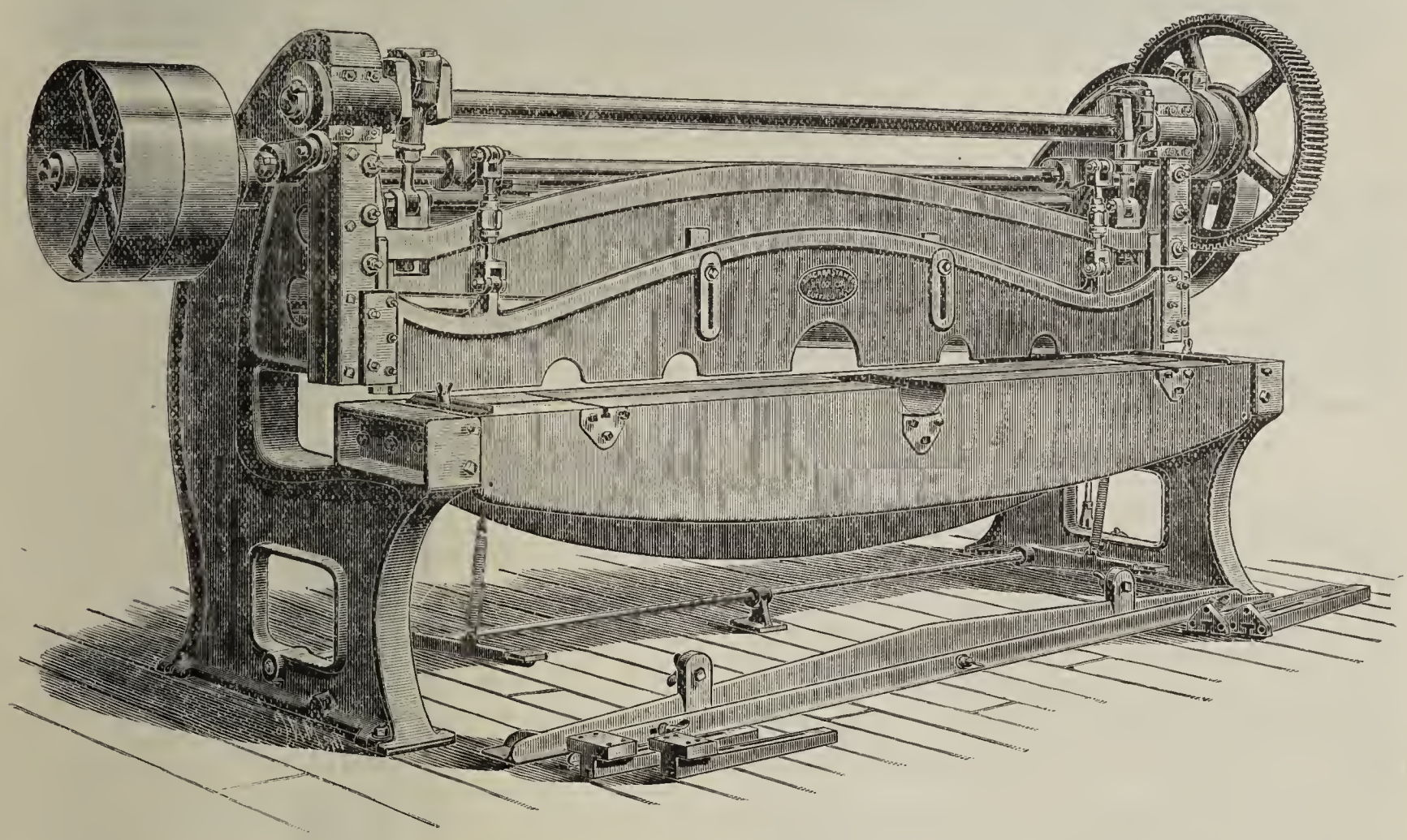
Joseph Raycraft has opened a plumbing shop at Beardstown, Ill.

L. D. Ballard, formerly a member of the firm of Adams & Co., Mohawk, N. Y., has started in the plumbing, tinning and steam fitting business in that town.

The Sanitary Specialty Mfg. Company, now at 68 and 70 West Lake street, Chicago, will remove May 1 to a double front building, 55 and 57 Clinton street at one end and 24 to 30 Milwaukee avenue at the other. The entire building, which is a three-story brick structure, will be occupied by this company. The location is but a short distance from their present quarters.

The Niagara Power Gap Shears.

The accompanying cut shows a power squaring shear with a cutting length of 10 feet, recently put on the market by the Niagara Machine & Tool Works of Buffalo, N. Y. It is intended for cutting iron and soft sheet steel up to 3-16 inch in thickness, and, owing to the gap in the housings, sheets of any length can be trimmed and split up to 15 inches from the edge. One of the principal innovations on the machine is an arrangement on the clutch that controls the motion, by which it is coupled in a positive manner to the gear wheel, thereby preventing the heavy cross head from dropping ahead of the wheel on account of its weight. This construction does away with counterweights or the undue brake pressure, which are usually employed to overcome this trouble. The hold-down works in lateral guides in the housings, and is actuated positively by means of a cam from the double crank shaft. Besides the bed a heavy transverse bar that serves at the same time as a support for the driving shaft connects the two housings. All working parts are provided with means for taking up wear. The manufacturers make similar shears with a cutting length of 8 feet.



The Niagara Power Gap Shears.

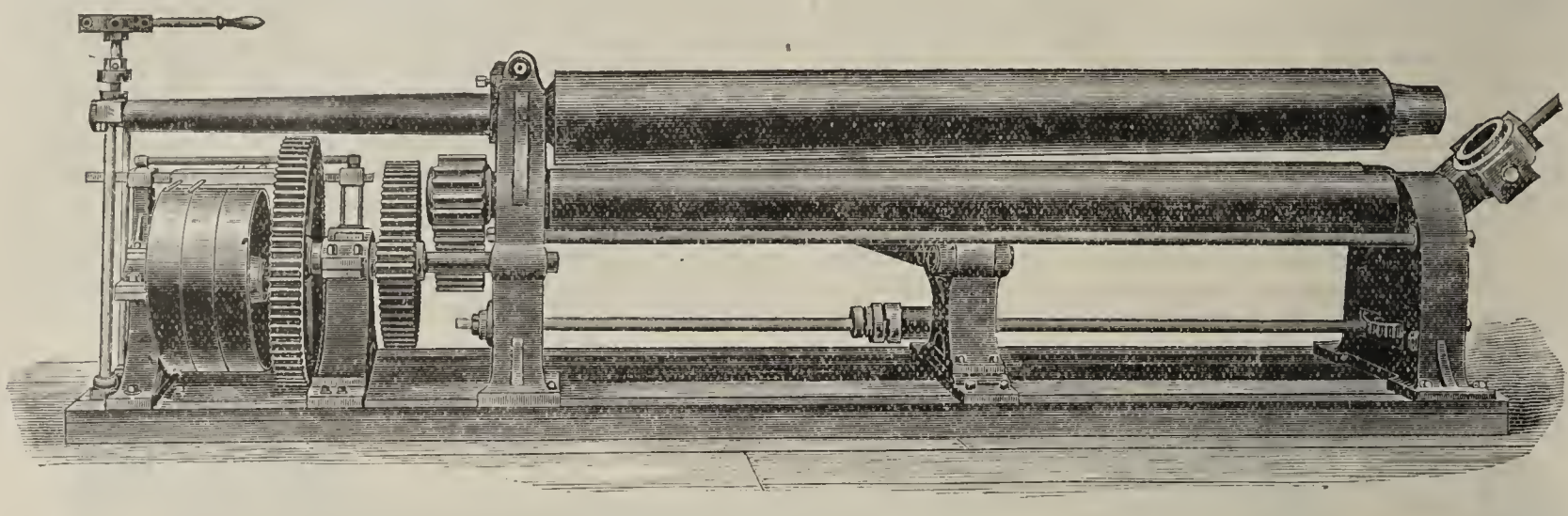
The British naval estimates for the fiscal year 1898-99 embrace a total appropriation of $118,890,000, an amount which has never been exceeded even in war time. The estimates provide for an addition to the personnel of the navy of 6340 men and for the building of three new battle ships, four amored cruisers and four sloops of war, also for making great extensions of the docks at Gibraltar, Portland and Dover. Surveys are also in progress for works at Bermuda, Jamaica, the Island of Mauritius and the Cape of Good Hope.

John H. Foy of Pottstown, Pa., is reported to have been awarded a contract for constructing a sewerage system for the entire city of Guadalajara, Mexico, for which about 100 miles of pipe will be required. The contract is said to involve about $1,660,000.

A strike which threatens to extend to every branch of the building trades in St. Louis, Mo., is reported as likely to come off on April 1. The step has been decided upon by the Bricklayers' Union, numbering from 1000 to 1500 members, who are threatened with a reduction of wages on the first of next month, and their action is supported by the local unions in the building trades.

The Wais & Roos Bending Rolls.

The bending rolls here illustrated are built by the Wais & Roos Punch & Shear Company, Cincinnati, Ohio, in different sizes and widths to suit requirements. The one shown is 10 feet 2 inches wide, with center bearing ; the lower rolls are 10 inches and the upper roll 13 inches in diameter. All are made of hammered steel. The top roll is raised or lowered exactly parallel by means of a ratchet on the end of a worm shaft, but cone shaped work may also be accomplished by disengaging the clutch so that one end of the top roll may be adjusted while the other end remains stationary. The drop housing for releasing the cylinders is made of cast steel, with swivel or tilting box which conforms with the radius and hence may be easily opened or closed by the operator. Extra heavy gearing is employed on the machine. Either pulleys for right and left belt or friction pulleys are provided, as may be preferred, or the machine may be equipped with an engine.



The Wais & Roos Bending Rolls.

American Patents in 1897.

The annual report of the United States Commissioner of Patents for the calendar year 1897 was presented this week to Congress. It shows that during the year there were received 45,661 applications for patents, and in addition a large number of applications for designs, trademarks, &c. Patents granted amounted in number to 23,729, including designs ; 65 patents were reissued, 1671 trade-marks registered and 14 labels and 16 prints. The number of patents that expired was 12,926. The total expenditures were $1,122,843 ; the receipts over expenditures, $252,798. The total balance of the credit of the Patent Office in the Treasury of the United States on January 1, 1898, was $4,971,438.

In proportion to population more patents were issued to citizens of Connecticut than to those of any other State —one to every 786 inhabitants. Next in order are the following : Massachusetts, District of Columbia, New Jersey, Rhode Island, New York. To residents of England 706 patents were issued ; to residents of Germany, 551 ; Canada, 286, and France, 222. The number of applications received for examination during the year was greater than for any other in the history of the office, yet the report says there was no increase in the facilities or force for doing the work. Applications awaiting action December 28 last numbered 11,382, due to the inadequacy of the office force. For the ten years beginning in 1840 the average number of applications was 1186, and for the eight years beginning with 1890 it has grown to 41,479 per year.

Of the applications for patents the most numerous were those directly connected with the development of electrical inventions. Inventions connected with cycles took the second place.

New Form of Rheostat.

Realizing the field for an improved form of rheostat or switchboard for controlling the current used in electroplating and galvanoplastic operations, the Zucker & Levett & Loeb Company of 526 West Twenty-fifth street, New York, have developed the multiple rheostat here illustrated. The rheostat is shown in combination with their new voltage indicator. The function of a rheostat being to regulate the current, it is essential that there be a sufficient number of steps for fine adjustment and a sufficiently high resistance, so that a single article may be plated without burning. By a new arrangement of the resistances there are in the smallest size 13 steps with 7 resistance strips and in the larger sizes 40 steps. This enables the plater to regulate the current with accuracy and to put the maximum amount of current through his work without danger of burning. The above, in conjunction with the fact that it is impossible to burn out these rheostats, makes them of value to platers doing heavy and constant work. The parts where current is carried or any heat is developed are made of slate or metal. Instead of round resistance wires flat strips are used, and are so proportioned that the smallest can be safely short circuited across the poles of the dynamo without danger.

The arrangement of the resistances is such that the large rheostats are capable of controlling the entire current of the room from one point.

The new form of voltage indicator has been substituted for the galvanometer formerly in use. This instrument is connected so as to be used in the same manner as a voltmeter, but is of simple construction and graduated in degrees instead of volts. Instead, therefore, of reading the voltage directly, as on a voltmeter, the proper deflection at which the work should be run is ascertained experimentally. Properly used, it is a very convenient and effective instrument of real value, and is in no sense the same as the old style galvanometer, which did not indicate the voltage, but showed simply the presence and direction of the current.



New Form of Rheostat.

TIN PLATES.

New Cold Rolling Method.

The cold roll equipment of the new 30-mill tin plate plant which the Shenango Tin Plate Company are erecting at New Castle, Pa., will consist of 28 cold mills, arranged in a manner which embodies a new departure in cold rolling practice. The mills are to be arranged in four trains tandem of three 20-inch mills each, with four trains tandem of four 22-inch cold mills each adjoining them. By this arrangement there will be seven separate lines of feed and each black plate will pass between four pairs of cold rolls instead of three, as has been the common practice hitherto. It is believed that a better finish will be imparted to the black plates by this method. Moreover, the lesser pressure which will be required by passing the plates through four times will ease the strain on the housings and rolls. The arrangement will involve no extra hand labor, as the feeding will be automatic.

SCRAP.

Dullness still reigns in the Tin Plate market here, although better conditions prevail in this department in the West. The mills are generally well supplied with orders and are running full, but the orders are mostly old ones. New contracts have been scarce of late. Prices are still unsatisfactory.

There is a heavy demand for Sheet and Tin Plate Bars, mills being well sold up and unable to make deliveries as fast as needed by consumers. In fact, several Sheet and Tin Plate mills have been compelled to close down for a day or two at a time until delayed Bars would arrive. The price of Bars is very firm.

A number of the Tin Plate works in the Pittsburgh district have been obliged to shut down this week, owing to the floods which prevailed in that section. Among other plants, those of the Monongahela Tin Plate Company and the Star Tin Plate Company, at Pittsburgh, and the Laughlin Nail Company, at Wheeling, W. Va., are reported to have been thus affected.

The United States Iron & Tin Plate Mfg. Company, Demmler, Pa., have added to their brands a Bright Coke Plate named Mifflin and a Terne Plate named Demmler Redipped.

The tin house of the Canonsburg Iron & Steel Company, Canonsburg, Pa., was destroyed by fire on March 13, together with its contents. Although the Tin Plate business of the concern will thus be interfered with for the time being, we are advised by L. A. Meyran, secretary of the company, that the rebuilding of the tin house will be started as soon as possible. Meanwhile the rolling mills and all the other departments of the works, which were not affected by the fire, are in operation as usual.

The report that the Monongahela Tin Plate Company, on the S. S., Pittsburgh, had placed an order for 24 hot and cold mills with Mackintosh, Hemphill & Co. of Pittsburgh is untrue.

The La Belle Iron Works, Wheeling, W. Va., have ordered a 20-ton traveling crane through the Pittsburgh office of Pawling & Harnischfeger, Milwaukee, Wis.

Notice has been given to the workmen at the Morewood Tin Plate Works, at Llanelly, Wales, to terminate contracts at the end of this month, but it is hoped that before that time some arrangement will have been arrived at for the continuance of operations.

"The Best Roofing Plate Made," is the legend printed on a card attached by chains to a fine sample of Osborn's guaranteed Old Style Terne sent out by J. M. & L. A. Osborn, Cleveland, Ohio. The card also gives a complete description of the Plate and its merits. The firm state that this brand has been manufactured for them since the Tin Plate industry was started in this country in 1891, and the time test shows it to be the equal of any Roofing Plate offered in the market. That the architects and roofers recognize its fine qualities is evidenced by the firm having just been awarded a contract for these Plates to go on the new East High School Building, at Columbus, Ohio. Messrs. Osborn advise us that all the principal Plates made in the country were submitted in competition, and out of five brands selected the successful bidder for the work chose Osborn's Guaranteed Old Style.

It is reported that the plant of the American Tin Plate Company, at Elwood, Ind., is likely to be further enlarged at an early date by the addition of six new mills.

Lighting with Acetylene Cartridges.

The Buffington Light Company are erecting a new factory on the property of the Niagara Falls Power Company, at Niagara Falls, for the manufacture of charges for lamps burning acetylene gas. The factory is a frame building 40 x 100 feet, two stories high, of frame. The Buffington Light Company are a new concern having a capital stock of $300,000. H. A. Brognard is manager. It is allied to the Electro Gas Company, which company claim to control the patents on calcium carbide. The Buffington company manufacture calcium carbide cartridges for all kinds of lamps, the cartridges, when water is applied, generating a supply of gas. Pending the completion of their new factory the Buffington company are carrying on operations in a temporary building, their main office being in New York. The business of the company marks a new departure in the use of acetylene, or rather in the manner of its application. To refill a lamp means the simple removal of the old cartridge and the insertion of a fresh one. This process requires but a moment, and can be done without soiling the hands. The lamps are clean, practical and smokeless, the light being pure and white.

Just at present the company are making three sizes of cartridges. One of these is for bicycle lamps, while two of them, known as Nos. 8 and 12, are for table and student lamps. All of the cartridges are made of metal in two parts, one sliding over the other to allow for expansion. When the consumed cartridge is removed from the lamp it is always found in its extended form, the residue occupying more space than the original carbide. The bicycle lamp cartridge is about 1¾ inches in diameter by 1¼ inches deep. It is filled with carbide ground to about the size of wheat, and will furnish a supply of gas sufficient to last from 3½ to 4 hours. The top and bottom of the cartridge boxes are perforated, the top being distinguished from the bottom by a hole in the center, and also by the fact that the piece of absorbent which is provided for the interior is blue on the top and white on the bottom. The absorbent also divides the interior into four parts. In charging the lamp the water valve is closed tight, the water chamber is filled with clean water, the charge is placed on the bottom with a spring on top of it to hold it in place. Then the top and the bottom of the lamp are pressed together on much the same principle as many oil lanterns. To start the lamp the water valve is opened by turning a finger piece to the left, and in a few seconds the gas will generate and the flame will light by simply holding a lighted match to the opening of the chimney at the top of the reflector. The light will not jolt out, but when it is desired to put it out the valve should be closed some minutes before the time it is desired to extinguish it, so as to shut off the water and stop the generation of gas. The size of the flame is regulated by the valve screw which governs the flow of water. If the flame blows it is evidence that the gas is generating too rapidly, the remedy being to close the water valve, and should the light decline it makes known the fact that more water is needed on the carbide. The manufacturers state that none of the cartridges will generate a sufficient amount of gas to explode the lamps in which they are used.

Charges Nos. 8 and 12 are filled with carbide about the size of corn. Both have a perforated tube in the center. No. 8 furnishes a supply of gas, with a ½-foot burner, for from four to five hours, while No. 12 supplies enough gas to last seven to seven and one-half hours. No. 8 uses about 12 ounces of water and No. 12 about 16 ounces in giving off its gas. The Electro Gas lamps will be marked with numbers signifying the number of cartridge to be used in them. Only one end of the large cartridges is perforated, and this end should be up when placed in the holder of the lamps in which they are used. No. 8 cartridge is about the size of an ordinary water glass and No. 12 is slightly larger. It is evident that the designs of the lamps in which these charges are burned can be made in many forms, and this the company will do.

SHEET METAL WORK.

SLATE AND COPPER ROOFING ON FIRE PROOF BUILDINGS VII.

BY WILLIAM NEUBECKER.

IRON FRAMING OF BULKHEADS.

On large iron structures having flat roofs, bulkheads and tank houses are framed by the man doing the iron work on the building, and are then covered with heavy galvanized plain and corrugated iron or infrequently with sheet copper. In Fig. 38 is shown a general view of the iron frame work of a bulkhead on a roof of a fire proof building after the wrought iron workers are through with it. A shows the window or door opening, as required, and holes are shown around the frame work on which the metal is bolted.

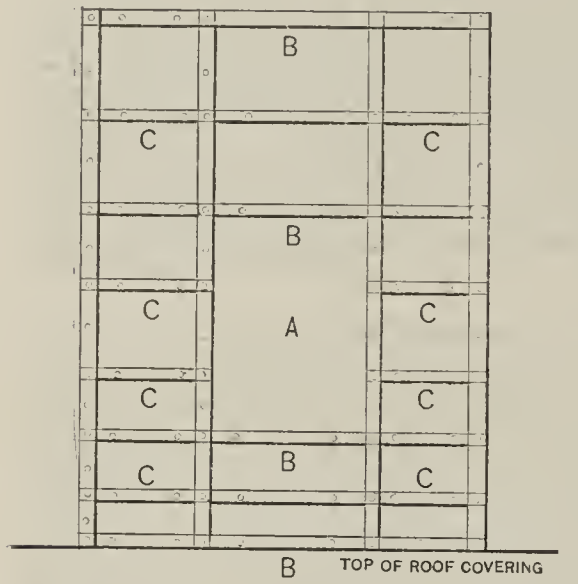


Fig. 38.—Appearance of Iron Frame Work of a Bulkhead on Roof of Fire Proof Building.

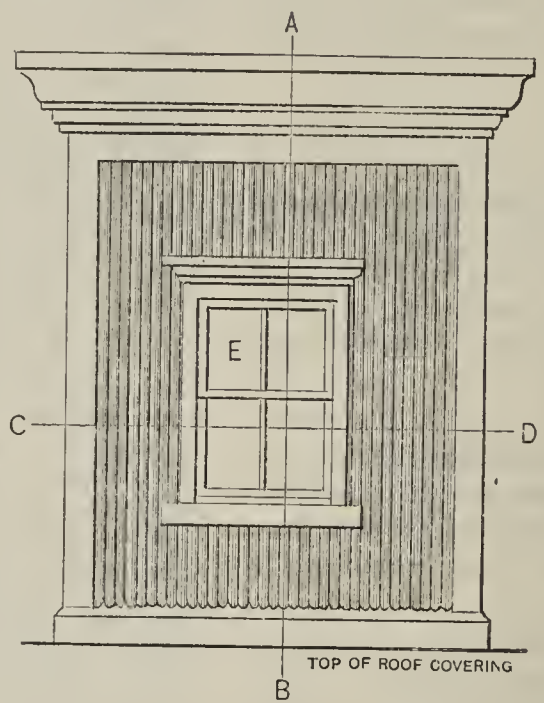


Fig. 39.—Appearance of Finished Bulkhead.

In Fig. 39 is a view of a finished bulkhead after the covering is placed over it. E indicates a wooden sash, while the rest is of metal.

DETAILS OF CONSTRUCTION.

In Fig. 40 is an enlarged section through A B of Fig. 39, showing how the metal work is fastened to the angle iron framing. Let A in Fig. 40 represent the roof line, B B B B the horizontal angle irons, C C C the flat bands having holes punched in them on which to fasten the metal, as shown by C C, &c., of Fig. 38. If the roof A in Fig. 40 is of metal it can be covered first and the flange of the base D soldered over it, while if the roof is of tar, asphalt or brick the base D must be set first, having a 6-inch flange extending out on the roof, over which the tar, asphalt or brick is laid. The base D being set in position with a wash and flange extending upward at E, the next step is to cover the wooden sill of the window frame H. This is covered by the metal sill F extending up under the window sash and nailed in white lead at I. The bottom of the sill has a drip, as shown at G, with a flange extending backward and downward, and is bolted at J. The corrugated sheet K is now slipped under the drip G and fastened to the band irons with round headed bolts at C C and through the flange of the bottom base at E. In Fig. 40 L represents the molding over the window shown

Fig. 41.—Enlarged Section on Line C D of Fig. 39.

Fig. 40.—Enlarged Section on Line A B, Showing Method of Fastening Metal Work to the Bulkhead.

by E in Fig. 39 and is fastened to the frame M by nailing the flange at N. The upper part of the molding has a wash and a flange extending upward at O. On the angle iron B furring strips W are bolted, as shown, over which the roof planking X is laid. Wooden brackets or blocking are now fastened to the roof boards on which to secure the upper molding P, which has a lock bent at the top V on to which the roofing Z is attached. The lower part of the molding P has a drip, as shown at R, and is fastened to the angle iron B by means of the bolt S. The corrugated sheet T is now placed under the drip R, bolted at C and riveted at U O. After the metal is bolted and riveted in position fire proofing is built up on the inside, as shown by the lines F^1 P^1 and F^2 P^2. It is sometimes the case that the fire proofing is already placed in the angle irons before the metal is put on, in which case long round headed

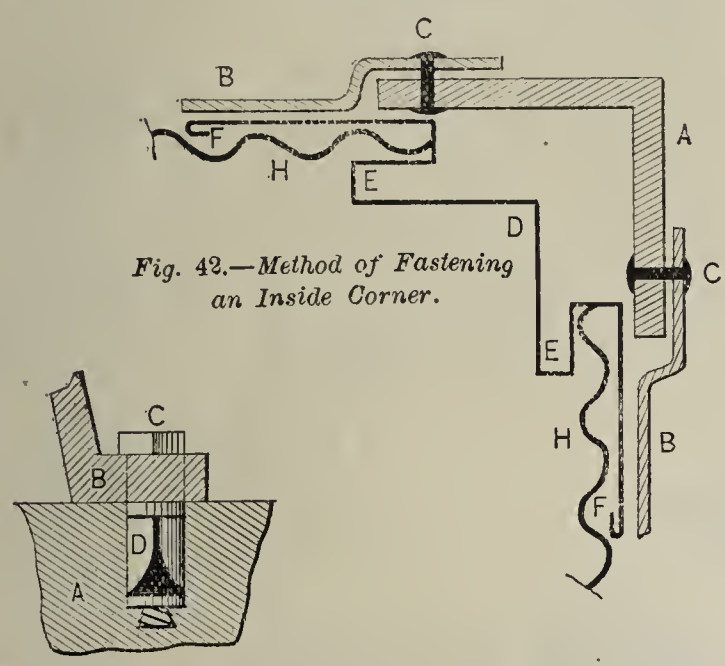


Fig. 42.—Method of Fastening an Inside Corner.

Fig. 44.—Method of Applying Expansion Bolt in Stone, Brick or Iron.

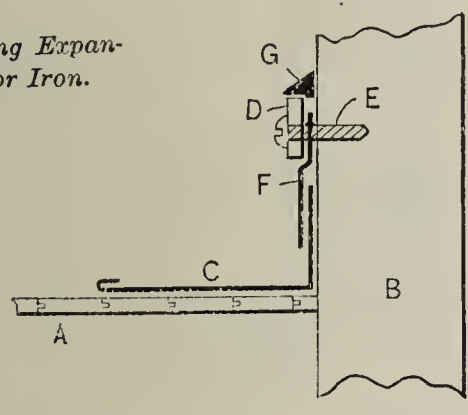


Fig 43.—Method of Securing Water Tight Joint Between Metal Flashing and Iron Work

SLATE AND COPPER ROOFING ON FIRE PROOF BUILDINGS

bolts of the desired length are run through the metal and fire proofing, as shown at A^1.

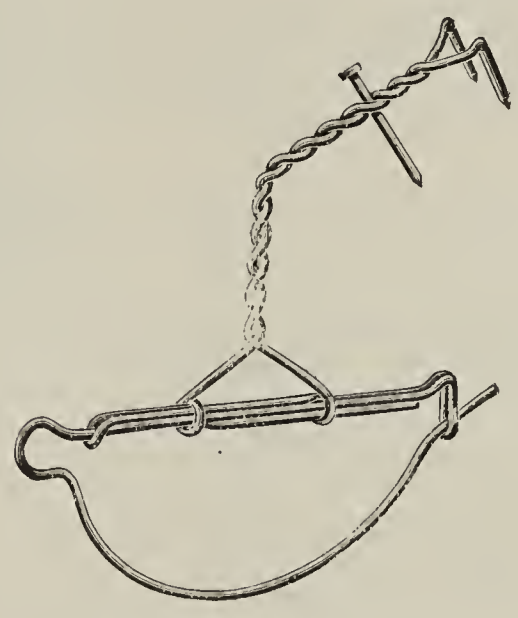
In Fig. 41 is shown an enlarged section through C D of Fig. 39, giving the details of fastening and construction. A A shows the vertical corner angles, B B the vertical angles of the window opening, C C C C the horizontal band irons and D the wooden window sash. Corner blockings of wood of the required size and shape are bolted to the vertical angles shown at H H and H^1 H^1 and are covered by the corner angles E E, having drips formed as at F F. These with flanges extend outward, having water locks attached, as shown at I I. The corner angles are fastened to the wooden blockings, as shown at X X, &c. The water lock is placed at I, as in case of water soaking behind the corrugated iron it will follow the course of the water lock and flow out at the bottom over the base flashing. The corner strips or angles for the window openings are formed and fastened in a similar manner with the exception that the inside returns against the wooden window frame and is nailed as shown, all similar parts being designated by similar letters. The angles having been put on as described, the corrugated sheets L L, &c., are placed behind the drips F F and fastened by means of the bolts M M, &c. The fire proof blocking is now built behind same, as shown by F^1 P^1 and F^2 P^2. It is sometimes the case that an inside angle occurs, when it is finished as shown in Fig. 42, A indicating the angle iron, B the flat bands riveted at C, while D is the sheet metal angle with drips at E E, and water locks on flanges at F and F; the corrugated iron covering is slipped under the drips at E and E, as shown.

OBTAINING WATER TIGHT JOINT BETWEEN COPPER AND IRON.

It is sometimes the case that a cast iron column extends through the roof, and around which the copper base and cap flashing must be flashed. In Fig. 43 is shown the method of obtaining a water tight joint under the conditions above named. Let A represent the roof line and B the iron column. The base flashing C is placed in the position shown, after which holes are tapped into the iron column a sufficient distance above the base flashing. The cap flashing F is now placed in its proper position, over which the flat band iron D, ¼ x 1½ inches in size, is placed, holes are punched into the band iron to correspond to the holes in the column or *vice versa*, then a screw is passed through the band iron and cap flashing and screwed into the tapped holes in the column. Roofers' cement is now placed over the band iron joint, beveled as shown at G, which makes a water tight job. In Fig. 44 is shown the method of applying expansion bolts in stone, brick or iron. Let A represent stone, brick or iron, having a hole drilled to correspond to the size bolt used. Let B be the bracing, with a hole drilled into the flange of the required size. Now place the bolt C into the drilled holes and by means of a wrench turn the head C, thus expanding the shell D, which holds the brace firmly.

Bell's Twisted Wire Hanger.

The eave trough hanger illustrated herewith is a recent addition to the line of hangers manufactured by John W. Bell & Co. of Mercer, Pa. The hanger is made of



Bell's Twisted Eave Trough Hanger.

two pieces of galvanized wire. The bar across the top is composed of three wires, so arranged and bound together as to get the greatest strength. The roof wires leave the bar separately, and each a short distance from the center, and are twisted together to form the roof piece, each terminating in a pointed driving hook. It is claimed that by this peculiar construction a hanger is produced which is exceedingly stiff and strong, that it can be quickly and easily put on the trough, and that it is very convenient to adjust and fasten to the roof. They are made in five sizes, from No. 5 to 9 inclusive, taking 3½, 4, 5, 6 and 7 inch eave trough in the order named. A patent is pending. The manufacturers will be pleased to mail a sample of it to persons who are interested.

C. G. Brunnckow, Providence, R. I., has secured the contract for Sheet Metal work for the Rhode Island State House, now under construction in Providence. The work includes two circular glass and copper domes, 18 skylights and the copper roofing.

FLASHINGS.

The Manhattan Cornice & Skylight Company of New York City have been incorporated with a capital of $5000 by M. S A. Wilson and J. T. Robin of Manhattan, and L. L. Firuski of Brooklyn, N. Y.

The Montpelier Steel & Sheet Company have been organized at Montpelier, Ind., on the co operative plan, with an authorized capital of $100,000, to manufacture Sheets.

J. H. Burns, Enosburg Falls, Vt., intends to erect a Tin shop for his own use as soon as spring opens.

O. Moncur, Yuba City, Col., is building an addition to his Tin shop.

The Piedmont Slate Company have organized for the development of slate quarries near Cedartown, Ga.

The Scottdale Iron & Steel Company, Limited, Scottdale, Pa., manufacturers of Iron and Steel Sheets, recently started two new Sheet mills, making eight which they are now operating, giving employment to about 375 men.

The La Crosse Steel Roofing & Corrugating Company, La Crosse, Wis., although in operation for a comparatively short time, have outgrown their quarters and need greater facilities. A site has therefore been bought on the corner of Jay and Third streets, near the Fred. Kroner Hardware Company, whose interests are closely identified. A substantial brick building, four stories high, 75 x 150 feet, is to be erected, which will be the largest business block in the city. Every convenience is to be installed for the rapid and economical dispatch of business. It will be connected with the building of the Fred. Kroner Hardware Company, which is across the street, by both an overhead bridge and a tunnel running from one basement to the other.

The well-known Slate firm of John Galt & Sons, 253 Broadway, New York, have issued a new edition of their useful little hand book on Roofing Slate. It is a booklet of 16 pages, containing in condensed form a large amount of practical information on the subject which cannot fail to be of interest to roofers, architects and users of Roofing Slate. The advantages of Slate as a roofing material are fully set forth, with information about buildings which can be slated, boards for roofing, how Slate is put on, rules for measuring Slate, and other special information in this line. Descriptions of the various kinds of Roofing Slate are also furnished, together with a table showing the sizes of Roofing Slate, the rule in lathing and the number of pieces in each square, and another table of the variation in the lap, showing the length of Slates exposed when laid. Messrs. Galt are also dealers in Slaters' Tools, Slate Dressing Machines, Slaters' Felt and Cement, Slate Nails, Structural Slate, Slate for stalls, platforms, steps, hearths, washtubs, flagging, and all kinds of milled stock.

A Reliable Test for White Lead Paint.

With the exception of the man who makes painting a business, there is perhaps no one, says a writer in *The Florist's Exchange*, who uses white lead to a greater extent than the florist. All the wood work about his houses is treated to at least one coat of it, and during the summer he applies it to the glass to shade plants still kept in side. He is often surprised and annoyed to find the paint cracking and peeling off, thus necessitating the additional expense of another coat. The trouble is not in the white lead itself, which if pure is the best material for his purposes. It lies in the adulteration of the lead with worthless substances, which cannot be detected by the eye. Much time, annoyance and expense may be saved by means of a simple, effectual test that will not require a chemical laboratory to get results. Here is one that requires only ten minutes and no apparatus but a bottle, a teaspoon and some blotting paper:

In a wide mouthed bottle put a large teaspoonful of the mixture of lead as it comes from the drum or keg. Add about four times its bulk of gasoline and shake thoroughly for about a minute. Pour it out upon white blotting paper or chemists' filter paper and allow it to drain. When the excess of gasoline has evaporated, put the lead back in the bottle, add about four times its bulk of strong vinegar and shake as before. If the powder disappears entirely the lead is pure. If it does not all dissolve allow the sediment to fall, pour off the liquid, add more vinegar and shake again. If still there be a residue, the lead has been adulterated. It will pay to buy some brand that leaves no residue.

This is but a simple question of chemistry. White lead is a basic carbonate produced by the action of carbonic acid and water upon metallic lead. This carbonate is readily soluble in acetic acid, which is the principal acid of vinegar. Sulphate of barium and sulphate of lead, the two substances most largely and frequently used as adulterants, are insoluble in acetic acid, so that the addition of either of these materials to white lead can readily be detected by the method explained. The object of using the gasoline is to dissolve out the oil which might interfere with the action of the acid. Gasoline need not be used if the lead be purchased in the form of powder and not already mixed with oil.

Comparison of Aluminum with Other Metals.*

It is evident that for any use of aluminum in the form of sheets, bars, tubes, wire or castings its light weight relatively to other metals should be taken into consideration in comparing the relative costs for any given purpose. The common metals—wrought iron, cast iron, steel, copper, zinc, tin, lead, brass, bronze, German silver, nickel, antimony and Britannia metal—are all much heavier, and the relative economy in using them in either the cast or worked shape can only be arrived at by multiplying the price of the heavier metal by the factor of its specific gravity relative to the specific gravity of aluminum. For convenience in these calculations the following table is given:

Metals.	Specific gravity.	Factor of specific gravity relative to aluminum.	Selling price per pound New York market in May, 1896, in large lots.	Relative selling price per pound New York market to aluminum obtained by multiplying price per pound by factor given in column B.	Value per pound that aluminum is thus relatively cheaper.	Value per pound that aluminum is relatively dearer.
	A	B	C	D	E	F
No. 1 aluminum, cast	2.56	1.000	$0.35	$0.35	.....	.....
No. 1 aluminum, wrought	2.68	1.000	.45	.45	.....	.....
Commercial copper, cast	8.85	3.457	.1025	.354	$0.004	.....
Commercial copper, wrought	8.93	3.332	.14	.466	.016	.....
Tin, cast	7.29	2.848	.1345	.383	.033	.....
Tin, wrought	7.36	2.746	.20	.549	.199	.....
Bronze, 16 tin, 84 Cu, cast	8.832	3.451	.12	.414	.064	.....
Bronze, 16 tin, 84 Cu, wrought	8.90	3.321	.18	.597	.147	.....
Britannia metal, cast	7.261	2.836	.125	.354	.004	.....
Britannia metal, wrought	7.301	2.724	.200	.545	.095	.....
20 % German silver, cast	8.60	3.360	.16	.538	.188	.....
20 % German silver, wrought.	8.70	3.246	.2925	.949	.459	.....
Nickel, cast	8.287	3.237	.35	1.133	.783	.....
Nickel, wrought	8.67	3.235	.45	1.456	1.006	.....
Brass, 33 Zn, 67 Cu, cast	8.32	3.250	.095	.309	.....	$0.041
Brass, 33 Zn, 67 Cu, wrought.	8.549	3.190	.12	.383	.....	.067
Antimony, cast	6.71	2.621	.08	.210	.....	.140
Lead, cast	11.36	4.438	.0308	.1367	.....	.2133
Lead, wrought	11.38	4.247	.045	.1911	.....	.2589
Zinc, cast.	6.861	2.680	.0410	.1099	.....	.2401
Zinc, wrought	7.191	2.683	.06	.1620	.....	.2880
Steel, cast	7.82	3.055	.025	.0764	.....	.2736
Steel, wrought	7.858	2.932	.016	.0469	.....	.4031
Iron, cast.	7.218	2.820	.006	.0169	.....	.3331
Iron, wrought	7.698	2.872	.015	.0421	.....	.4079

The first uses to which aluminum was applied were naturally those which would stand the high cost of the metal at its selling rate of $10 to $15 per pound.

The first considerable use of the metal was for tubes of opera glasses and other optical instruments. Then, as the metal became lower in price, it was used in thin sheet and metallic foil in a similar way to gold and silver. It was also used in powder made from the foil. Thereafter came the use of the metal in the manufacture of a large line of fancy goods, where the cost of the metal used was a small proportion of the total cost, including the workmanship involved. These, for a considerable length of time, were the staple uses for aluminum; but the tonnage —or rather, to be more accurate, the "poundage"—of metal which could be used for these articles was of necessity very limited, and before the aluminum could be used like other metals the price had to be materially reduced. This was done in the years 1891 and 1892—at first due to accidents of patent litigation, and before the companies then manufacturing aluminum by the present process had so far perfected the process and increased the capacity of their works really to warrant the decreased selling prices by their cost of manufacture; but since the year 1892, with the greatly improved and extended facilities for production introduced by the large manufacturers of aluminum, they have been enabled gradually to reduce the selling price, until to day the rate is such that aluminum is a cheaper metal, section for section, than copper, and as cheap as brass.

* From a lecture on the "Utilization of Aluminum in the Arts," given before the Franklin Institute of Philadelphia, by President Alfred E. Hunt, of the Pittsburgh Reduction Company.

THE RETAIL STORE.

William Vogel.

We regret to record the death, after a painful illness from cancer in the head, of William Vogel, founder and head of the well-known tinware manufacturing firm of William Vogel & Bros., Brooklyn, N. Y., which occurred at his home, 202 Keap street, Brooklyn, on Monday, March 21. Mr. Vogel's illness dates back to last December, when, although apparently in vigorous health, the first sign of a cancerous growth appeared above the left ear. This was removed, but reappeared shortly in the neck. Two months ago an operation was performed, which for a time appeared to promise success. That also failed, however, and although Mr. Vogel occasionally went to business until about three weeks ago, the disease made rapid progress, terminating fatally as mentioned above.

William Vogel was born in Brooklyn, in 1839. After a public school education he obtained employment with a tin roofer. In 1863, in conjunction with his brother Henry, he began the manufacture of tinware on a small scale on Grand street, Brooklyn, removing to various locations in the Eastern District of the city as the business grew in proportions. Twenty years ago the brothers purchased a small lot 50 feet square and put up a factory building on the site of the present extensive five-story factory of the firm, which now extends from 37 to 47 South Ninth street and on 433 and 435 Kent avenue, giving employment to a large staff of work people. The growth of the business of the firm from small dimensions to its present extent is a singular instance of what frugality, integrity and habits of strict attention to business, such as exercised by the late Mr. Vogel, can do. As the head of the firm he was particularly careful never to increase or extend his business unless he was prepared at the same time to meet increased obligations. He paid all his indebtedness in cash, and by thus avoiding the discounting of bills was always able to furnish his customers with the articles he manufactured at reasonable or the lowest market prices.



WILLIAM VOGEL.

William Vogel had a number of interests outside of his immediate business pursuits and was in every sense of the word a public spirited citizen. He was of a generous and sympathetic nature and attracted to himself many warm friends, also giving freely of his means to all deserving local institutions. He was a lifelong advocate of temperance and was active in church work. He was a trustee of All Souls' Universalist Church of Brooklyn, and was an ardent Free Mason, besides being a member of the Union League and Hanover clubs. He was also a director in several local financial corporations and was connected with the Manufacturers' Association of Kings and Queens Counties, the Society of Old Brooklynites and a number of other organizations.

Mr. Vogel leaves a widow, two daughters and a son, William H. Vogel, who, together with his uncles, Henry J. and Louis H. Vogel, compose the present firm of William Vogel & Brothers. The funeral service was held on Wednesday evening at All Souls' Universalist Church, and was very largely attended by the friends and business associates of the late Mr. Vogel. Interment was made the following day at Greenwood Cemetery.

MEMORANDA.

Wm. Holker, who has purchased the stock of J. C. Stanley on Water street, Newburyport, Mass., has decided to move his large stock of Stoves, &c., from his present quarters in Market square to the store in which Mr. Stanley did business.

Oliver S. Kendall & Co., dealers in Stoves, Furnaces and Heaters, 466 Main street, Worcester, Mass., will occupy new quarters after July 1, which will enable the firm to increase their facilities. For some time past there has not been sufficient room to meet the growth of the business, so the present store of Lathrop, the shoe dealer, at 564 Main street, has been secured, as well as the story above and the basement. The shop, which will be fitted with new machinery and steam power, will be located in the old electric light plant in the rear of the store, and will occupy the first, third and a quarter of the fourth story. Messrs. Kendall have been in the present location for 11 years and in the store two doors north another 11 years, making 22 years in all, during which time the business has rapidly expanded.

J. T. Templeton has retired from the Stove and Hardware firm of Johnson, Doss & Co., Nashville, Tenn.

The regular meeting of the Retail Stove Merchants' Protective Association held in St. Louis March 9 was well attended, but there being no serious business to demand the time of the members the conference turned into a social occasion, and included an instrumental and vocal musical programme, besides some effective oratory. The whole occasion was most enjoyable, and speaks well for the interest taken by the members in the association. The officers are: President, G. A. Pauly; vice-president, F. S. Bolte, and secretary, M. Koch.

R. E. White has moved to the Eans Building, Smithville, Texas, and has arranged to carry in stock a complete line of Tinware.

The Artistic Enameling Works, Ninth and Monroe streets, St. Louis, Mo., issue a circular calling attention to their specialty, which is Enameling on Steel and Cast Iron. They do all sorts of work in this line, and particularly mention their facilities for coating cooking utensils, saying that they are prepared to enamel and decorate any style of coffee or tea pot, cooking pots, large or small, and any cooking utensils for hotel or family use.

Goodwin & Co., 133-137 Newhall street, Birmingham, England, and Bunney's, Limited, Church street, Liverpool, England, are desirous of receiving catalogues and price-lists of household Refrigerators.

The large Tinware factory of Keen & Hagerty, Baltimore, Md., which, as reported in our last issue, was visited by a severe fire on the 12th inst., is again under roof and the machinery is now running night and day, the company having adjusted their insurance so far as it is concerned. The stock of merchandise which was not burned or ruined by smoke and heat was damaged by

water. Fortunately, however, the larger part of the machinery was intact and uninjured.

The H. F. Neumeyer Mfg. Company, Macungie, Pa., issue a descriptive and illustrated catalogue of their manufactures. The goods shown in the little pamphlet include Nozzles of various styles and shapes for fire and garden purposes. The Niagara Lawn Sprinkler is illustrated, likewise the Peerless Automatic Anti-Freezing Hydrant, as well as the Peerless Street Washers.

The Middlesboro Furniture & Stove Company have opened up business at Middlesboro, Ky., with I. Ginsberg as manager.

The Cold Wave Refrigerator Company, Fond du Lac, Wis., have issued an illustrated catalogue of their Cold Wave line of Refrigerators. They are constructed of hard wood, with seven walls for insulation, zinc lined, have removable cleanable ice tanks, and are fitted with porcelain lined water coolers in same styles. A full line is made for all requirements.

C. Stoutenborough, manufacturer and dealer in House Furnishing goods, will remove his office and warerooms on April 1 from 272 Pearl street, New York, to larger quarters, at 277 Pearl street.

At the postponed annual meeting of the Central Stamping Company, New York, recently held, the following officers were elected for the ensuing year: President, John H. Sprague; vice-president, Walter M. Aikman; secretary, George W. Ketcham; treasurer, E. W. Ketcham, and D. B. Hunt, assistant treasurer. The new management contemplate some betterments and enlargements of their factory facilities for the purpose of increasing their output.

Clinton Wire Cloth Company, Clinton, Mass., well known as manufacturers of Wire Cloth, Wire Lath, Fencing and Nettings, issue an attractive card in colors, showing 19 different styles of perforation in metals, and announce that they have exceptional facilities for perforating of every kind, including steel, iron, bronze, brass, zinc, copper and galvanized iron, Filter Press Plates and Brass Centrifugal Plates.

Henry B. Haigh, vice-president and general manager of the Iron Clad Mfg. Company, 22-24 Cliff street, New York, has severed his relations with that company, and is now president of the American Stoker Company, whose main offices are at 26 Court street, Brooklyn, N. Y. The American Stoker Company are manufacturers of an automatic mechanical device for feeding coal into boiler furnaces.

Thomas F. Farmer and D. E. Hirshfield, under the firm style of Thos. F. Farmer & Co., have recently established themselves in business as manufacturers' agents, with headquarters at Waco, Texas, and branches at Dallas and San Antonio. Mr. Farmer is an old Texas traveling salesman, and formerly represented the Oliver Wire Company of Pittsburgh and other concerns. Mr. Hirshfield was for nine years a broker in Fort Worth. Up to this time the firm have not carried stock, but a little later they expect to establish a transfer house in Dallas. They are at present representing manufacturers of Shelf and Builders' Hardware, Brass Goods, Electrical Supplies, Stoves and Ranges, Plumbers' Supplies, Agricultural Implements, Wagons, Railroad Supplies, &c., representing among other concerns the Morrison Mfg. Company, Fort Madison, Iowa; Central Oil & Gas Stove Company, Gardner, Mass.; York Mfg. Company, Portsmouth, Ohio, and Toledo Wheelbarrow Company, Toledo, Ohio.

Bump & Walrond have succeeded H. A. Easton & Co. in the retail Hardware and Stove business in Petoskey, Mich.

The partnership existing between H. E. Noble and H. H. Case, at Medicine Lodge, Kan., under the firm name of Noble & Case, and also the partnership existing between Messrs. Noble and Case under the style of Noble & Case Hardware Company, Alva, O. T., have recently been dissolved by mutual consent Mr. Noble will continue the Alva business, carrying Shelf and Heavy Hardware, Stoves and Tinware, Pumps, Wind Mills, Wagons and Buggies, Implements, &c., and Mr. Case the Medicine Lodge business, carrying a line of Hardware and Implements.

J. G. Olive & Son have succeeded J. G. Olive in the Hardware business in Cuba, N. Y. A tinning and plumbing shop has been added to the establishment.

Zach. T. Miller & Sons have succeeded Myers & Miller, at Bloomington, Ill., wholesalers and retailers of Shelf Hardware, Stoves, Tinware, Furnaces, Electrical Supplies, &c. The new firm have just completed remodeling the interior of the storeroom.

W. J. Westergaard has succeeded Westergaard & Coop, at Valley City, N. Dak. Mr. Westergaard handle Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements, Sporting Goods, &c. He has just completed a warehouse on the railroad, 30 x 50 feet in dimensions, two stories high. This will be utilized for the storage of Implements, Buggies and Carriages.

The Jarboe-Woolley Hardware & Implement Company, Davis, I. T., are successors to Wm. M. Moore in the wholesale and retail Hardware, Stove, Implement and Sporting Goods business. Mr. Jarboe was formerly with Gilkey Bros. of Chickasha, and Mr. Woolley has been connected with the Royal Cement Plaster Company of Marlow.

Barkley & Arnett have purchased the Hardware stock of Holloway & Co., Nicholasville, Ky. The stock comprises Shelf and Heavy Hardware, Agricultural Implements, Sporting Goods, Stoves and Tinware, &c.

W. O. Aikman and Dudley D. Norton have formed a partnership, at Cazenovia, N. Y., under the firm style of Aikman & Norton. Mr. Aikman has had fifteen years' experience in the Hardware business at Roxbury. Mr. Norton is a practical plumber, and particular attention will be given by the new firm to plumbing and heating. They will also retail a line of Shelf Hardware, Tinware and Stoves.

Hunt & Flaherty have recently opened up in the Hardware, Stove and Implement business in Stithton, Ky.

C. E. Harrison is about opening a new Hardware store at Binghamton, N. Y. A wholesale and retail business will be carried on in Shelf and Heavy Hardware, Stoves and Tinware, Agricultural Implements and Sporting Goods. Mr Harrison's fixtures are all new and the store is of modern character. Silver Plated Flat Ware and Sporting Goods are taken care of in counter showcases, while wall cases are provided for his line of Tools and boxes for Shelf Hardware. The second floor of the building carries the stock of Bicycles and Baby Carriages, while the basement is devoted to storage.

Some Erie Specialties for Burning Gas.

One of the interesting novelties which have recently been placed upon the market by the Griswold Mfg. Company of Erie, Pa., whose New York warerooms are at 294 Pearl street, is what is known as the Erie gas or vapor stove griddle, views of which are presented herewith. These griddles are the manufacturers' regular Nos. 12 and 14 polished iron griddles, equipped with hollow base, which, it is stated, prevents the extreme heat of a gas or vapor stove from overheating the center of the griddle while distributing the heat uniformly under it. Fig. 1 of the illustrations shows the general appearance of the griddle, while in Fig. 2 is presented a cross section. The heat enters the base through holes in the lower part and passes out around the edges of the griddle, as shown in the cross section. Still another interesting production of



Some Erie Specialties for Burning Gas.—Fig. 1.—Erie Gas or Vapor Stove Griddle.

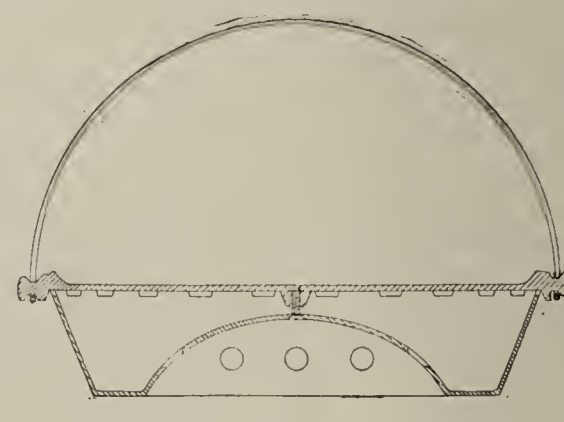


Fig. 2.—Cross Section of Griddle.

this company is the nursery gas stove shown in Fig. 3 of the engravings. A special feature of the device is an iron saucer under the burner which keeps the heat from the table, and holds any dripping which may be spilled while cooking operations are in progress. There is a special arm on the end of the burner for the purpose of holding



Fig. 3.—Nursery Gas Stove.

curling irons. The device is offered in three styles of finish—plain, white nickel and polished nickel.

"Klondike Grubstakes."

"Klondike Grubstakes" is the suggestive title of a monthly publication issued in Seattle, Washington, having for its purpose the dissemination of knowledge peculiar to outfitting for the Yukon and Klondike gold fields. In it are schedules giving assortments and quantities of supplies for one year for one man in provisions. In the grocery list are 39 separate items in comestibles, considered indispensable, ranging from flour and bacon to Jamaica ginger, yeast cakes and evaporated vinegar. Then there are separate lists of clothing, leather and rubber goods, medicine kit, &c. Sharing in importance with the grocery items is the catalogue of necessary Hardware, designed for the use of two persons, which we reproduce *in extenso*. Where the quantities are not given the individuals will use their own discretion, the statement being made that the various inventories contain the names of all that is necessary for a complete Yukon outfit, the data having been compiled from reliable sources:

1 Yukon Stove.
2 Picks.
1 extra Pick Handle.
2 Shovels.
1 Pit Saw with tiller and box.
1 5-foot one-man Saw.
2 Pit Saw Files.
1 24-inch 7-point Hand Saw.
1 28-inch Rip Saw.
2 Hand Saw Files.
1 single or double bit Axe.
2 extra " "
1 Axe Stone and File (14-inch mill).
1 2-pound Broad Hatchet.
1 No. 2 Claw Hammer.
1 1-crease Calking Iron.
1 No. 13 Jack Plane.
1 Draw Knife (Cantello).
1 Brace and 3 Bits.
1 spool No. 24 Copper Wire.
1 box assorted Copper Rivets and Burrs.
1 6-inch Monkey Wrench.
1 4-inch Screw Driver.
1 2-foot Rule.
1 6-inch Magnet.
Awls and Tools.
Chisels.
8 and 10 ounce Tacks.
Hob Nails.
Padlock.
Hasp and Staple.
Quicksilver.
2 Miners' Lamps.
Can Opener.
Candles.
Tape Line.
Law book.
Chalk and Line.
2 Candlesticks.
1 pair 7-inch Scissors.
2 good Pocket Knives.
1 8-inch Butcher Knife.
1 2 x 6 Emery Stone.
3 Fry Pans.
2 Coffee Pots.
3 Granite Plates.
2 Granite Cups.
3 Knives, Spoons and Forks.
2 Basting Spoons.
3 Granite Buckets.
2 Gold Pans.
1 4-ounce Gold Scale.
1 Compass.
Fishing Tackle.
Rifle and Cartridges.
15 pound 8d. Wire Nails.
10 pounds 10d. Wire Nails.
5 pounds 20d. Wire Nails.
100 feet ⅝-inch Manila Rope.
100 feet ¾-inch Manila Rope.
5 pounds Oakum.
5 pounds Pitch.
3 pounds Tallow.
1 Pack Strap.
Spring Balance.
Whet Stones.
3 coils Electric Solder.
1 12-quart Retinned Milk Pan.

Gurney Refrigerators.

The Gurney Refrigerator Company, Fond du Lac, Wis., have issued two illustrated catalogues, one referring to the Gurney patent and the other to the new La Belle refrigerators. The Gurney patent line comprises a full assortment of domestic constructions, grocers' boxes, ice chests, cooling rooms, water coolers, &c. They are insulated not only by walls of inodorous paper, zinc and inner and outer cases, but also by a packing of mineral wool. A special feature is the removable galvanized ice compartment, which is not only designed to secure cleanliness, but also exceptionally free circulation of air. The exterior designs adopted for this season are unusually attractive. The new La Belle line is made of hard wood, with six walls, including two of charcoal sheathing made expressly for this work, an ice chamber with large end flues for the free circulation of air, removable galvanized ice rack, metallic shelves, solid brass and bronze hinges, &c. These refrigerators are made in all styles for all requirements.

New Tinware Plant.

The Eastern Tinware Company have decided to enlarge their present factory at Portland, Conn., to about double its present capacity. The new factory, on which work has begun, will be built contiguous to the present plant, but will be operated by independent power, and will give employment to 400 or 500 more hands. The company's existing plant, although extensive, has proved inadequate to the requirements of their business. For some time past the run of orders received has necessitated continuous overtime. Joseph Scheider, the president of the Eastern Tinware Company, is also the head of the American Stamping Company of Brooklyn, N. Y., and the interests of the two concerns are closely allied.

Swedish Linemen's Pliers and End Cutting Nippers.

Smith & Hemenway Company, 10 Warren street, New York, are importing the Swedish round edge linemen's pliers, shown in Fig 1, patents for which have been applied for. The plier with side cutter is known as No. 115,

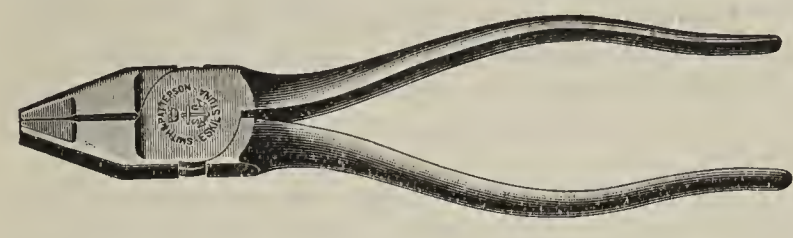


Fig. 1.—Linemen's Round Edge Side Cutting Pliers

and is made in 4, 5, 6, 7 and 8 inch sizes from Swedish electro boracic steel. They are designed especially for linemen, although suitable for any wire workers' use who have need of a tool of this character. The edges are rounded so that if dropped no injury is done to wire they might strike. The joint is so made that there is no space between it and the cutters, and the two parts are fastened with a patent bolt joint. They have also put on the mar-

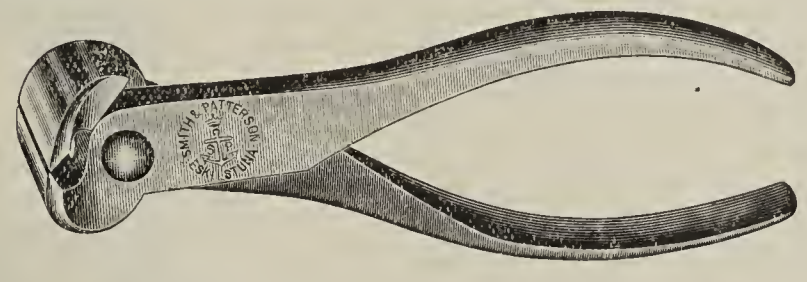
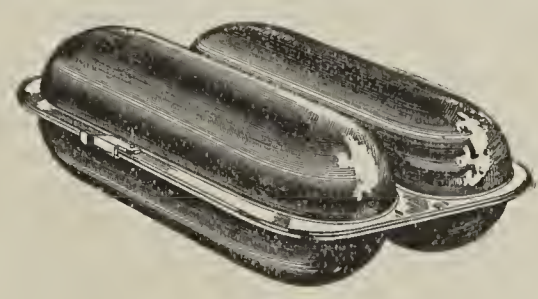


Fig. 2.—Samson Joint End Cutting Nipper.

ket the Samson No. 2 Swedish end cutting nipper, as seen in Fig. 2. This is made of the same stock and can be had in 5, 6, 7 and 8 inch sizes. The material and workmanship in both tools is such that tempered and regular steel wire nails of large sizes can be readily cut, and while held by the cuttters bent into various shapes without affecting the jaws. They will then make a clean cut of thin paper by hand pressure.

Ideal Double Bake Pan.

The accompanying cut shows the new double bake pan which Matthai, Ingram & Co., Baltimore, Md., are introducing. The pan is in the main similar to the single pan introduced by the makers a short time ago, the difference being that it will bake two loaves at one time. When not required for use and for convenience in storage the pan may be nested in halves and its bulk thus easily reduced. The makers state that the pan is an admirable baker in



Ideal Double Bake Pan.

every respect, is very easily cleaned, and may be sold cheaper than any bread pan of the same order at present on the market.

The newly organized Atlantic Transportation Company have received a contract to furnish a large quantity of New River steam coal per annum, for five years, for the use of the ocean tugs and barges of the Chesapeake & Ohio Railroad Company at Newport News, Va.

STOVE TRADE NOTES.

William Doyle.

William Doyle of Albany, N. Y., one of the few remaining old time stove manufacturers of the country, died at his residence in that city on the 18th inst. in the seventy-fifth year of his age. Mr. Doyle was a veteran in the business and was well known as one of the most prominent founders and inventors in the trade in the days when Albany and Troy were the leading stove manufacturing cities of the United States. He was born at Pittsburgh, Pa., on January 6, 1824, his parents removing to New York City when he was a child, and there he received his education in the public schools and colleges of that time.

When a young man, his father having died, he moved with his mother and brothers to Albany, where he became connected with the Rathbone & Kennedy Stove Works, then the largest concern in the world, devoted exclusively to stove making. He succeeded to the position of general superintendent, which he held until the year 1857, when he purchased a foundry and machinery works at Kenosha, Wis., where he did an extensive business until 1860. He then decided to accept an offer to dispose of the business, which he did, and returned with his family to Albany. After looking for an investment for some time, he purchased the Eagle Stove Foundry in that city, known for many years as the Eagle Air Furnace, the melting of iron having been done there by natural draft without the use of a blast. Here he built up and conducted a large and profitable business for over a quarter of a century and accumulated a large fortune.



WILLIAM DOYLE.

Few men in the trade are better known among the old line of stove and hardware men East of the Mississippi than Mr. Doyle, and his likeness which we present to our readers will be readily recognized by many friends and former patrons in all sections of the country. Politically Mr. Doyle was a stanch Democrat of the Jeffersonian school and represented his party in the Legislature in the years 1861 and 1862, and though often urged to accept nominations since for positions of honor and trust, he persistently refused to consider them, preferring to remain in the ranks and devote his time to his business interests. He was a warm personal friend of the senior Erastus Corning, Peter Cooper, William Cassidy and Daniel Manning, who each in his time was the leader of the party in Albany city and county.

Through heavy investments in iron mining properties, the product of which proved of no value he became financially embarrassed and disposed of his business in 1890. His health also failing him, he became discouraged and gave up active business. His wife, to whom he was devotedly attached, died in 1895, and this wore heavily on him, doubtless hastening his death. Mr. Doyle's ancestors were early settlers in this country, one branch of the family settling in Pennsylvania, the City of Doylestown being founded by them; another branch settled in Georgia, and were heavy slave holders in ante-bellum days, while still another branch are settled somewhere in California. He is survived by one son, Edward H. Doyle of New York City, and three daughters, Mrs. James O'Neil, Mrs. F. D. Howe and Mrs. M. V. Dolan of Albany. His funeral took place on Sunday the 20th inst. from the Cathedral of the Immaculate Conception, and was largely attended. His remains were interred in the family plot in St. Agnes' Cemetery.

A Paragon Among Pamphlets.

An elongated pamphlet bound in imitation agate ware and carrying on the cover a pathetic picture of distressed gentility commands attention and constrains any one who reads the first paragraph to follow it through to the end, where are mentioned the Paragon furnaces, made by Isaac A. Sheppard & Co. of Philadelphia and Baltimore. This is one of a multitude of clever pieces of trade literature from the press of Charles Austin Bates of New York. As an example of the style of the story we quote below the first page, and like the unfinished stories in the weekly papers we know that all will be interested to learn the conclusion, and this can be easily done by writing to Messrs. Sheppard & Co. for a copy of the booklet.

This man is somebody's customer. Is he yours? Does that hurt look on his face lie to the debit side of your ledger? Are you responsible for the things this man is thinking away down in his æsophagus? Is it your customer who plunges madly down into the nether darkness, arrayed in faultless attire, to well nigh jolt his medulla oblongata in to his acetabulum in the struggle to shake a furnace sold him by you? Is it your customer who shakes and shakes and shakes, until he dislocates a township and twists two parallels of latitude, merely to succeed in filling the entire house with a cloud of dust and ashes, as dense as a restaurant beefsteak, and as persistent as a lightning rod agent? Is it your customer who loads his furnace with coal—real Klondike coal, worth $7.50 a ton—clear to the gills, and battens down the hatches, and then goes upstairs and sits in a row on the register and shivers like a jelly fish, while the heat from that coal goes up the chimney, and overheats the Pleiades and wastes its warmness on the far off stars? Does he do all this every day, day after day, through seed time and harvest, until he has chronic cricks and even rivers in the nape of his neck, and large, hard, callous spots on his conscience, until finally the coroner's jury writes his epitaph: "He strove to shake the furnace, but the furnace shook him?"

Carbonic Oxide and Red Hot Stoves.

In a recent issue of the *Progressive Age* appears an article translated from *Le Genie Civil*, on the toxic properties of carbonic oxide, which is an interesting contribution to the discussion of the effect of red hot iron surfaces on air. The article contains the records of a number of experiments, one of them, it is stated, confirming the fact that the production of carbonic oxide gas by a red hot stove had been discovered. This was done by taking a

porcelain tube, filling it with particles of broken up cast iron, heating the tube to a red heat, and passing carbonic acid gas slowly through it. The gas after passing through the tube showed the presence of carbonic oxide in large quantities. This experiment was repeated many times with always the same results. The practical conclusions deduced from the experiments, as stated in our contemporary, are :

A conclusion follows from all the experiments upon red hot cast iron stoves that should interest every maker of stoves or heaters. If one wants to use cast iron surfaces carried to a red heat it is necessary to cover these surfaces with plates so far removed that they themselves will not become red hot. Double doors are thus necessary. It is, moreover, necessary that the air which circulates between these plates, or inside the casing, should not be conducted directly into the space to be heated, but should be led off in a pipe parallel to the stove pipe or flue. Manufacturers no doubt will find such an arrangement not difficult to devise.

Puritan Gas Ranges.

Within the covers of a very attractive catalogue of 48 pages the Cleveland Foundry Company of Cleveland, Ohio, illustrate and describe some of the various styles and sizes of Puritan gas stoves and ranges. Reference is made to the excellent workmanship and fine quality of material employed, and it is pointed out that the burners are constructed on "economical principles giving the greatest efficiency with the least possible consumption of gas." Attention is first invited to Series No. 250, in which the top of the range with shelf has an area 32 x 22 inches, while the hight of the stove is 33 inches. The range is provided with a simmering and double burner, the latter operated with one valve, balance drop doors provided with a strong spring which prevents the hinges from breaking and makes the doors self closing when raised, asbestos lined ovens, removable cast iron oven bottom and adjustable valves to suit any pressure of gas, either natural or artificial. Several styles of this series of the Puritan range are shown by means of handsome engravings, after which attention is given to Series No. 450. made in an enamel finish which, it is claimed, will not rust and has all the best improvements, including adjustable valves and the company's new oven lighter, these goods being followed by Series No. 350, embodying many valuable features of construction. Some of the ranges illustrated show styles provided with improved broiler and also with broiler and water heater. Two and four hole ranges of moderate price are considered, together with a varied assortment of Puritan gas hot plates, high gas stoves with drilled burners, tubing, ovens, &c. The pamphlet is issued in very attractive form, and is bound in colored paper covers. The company also manufacture a large line of gas heating stoves, gas radiators, hot air registers and Mrs. Potts sad irons, for which separate catalogues are issued.

ODD PLATES.

The Secretary of State of Ohio has issued papers of incorporation to the Standard Heating & Mfg. Company of Cleveland, with a capital stock of $25,000. The company are to engage in the manufacture of Hot Air Furnaces. The incorporators are George W. Hill, Robert L. Short, Henry I. Emerson, Frank C. Marrak and Peter H. Gifford.

Under the will of the late Isaac A. Sheppard, president of Isaac A. Sheppard & Co. of Philadelphia, provision is made for the payment to each person that has been continuously in the employment of the firm at their foundries in Philadelphia and Baltimore for the period of two years before the death of Mr. Sheppard a sum of money equal to two weeks' pay. In addition to the sum of $16,000 bequeathed by Mr. Sheppard to various charities, $1500 is left in trust to be invested and the interest to be applied to the purchasing of suitable gold and silver medals, to be awarded from time to time to the two most worthy graduates of each of the first two public manual training schools of Philadelphia, in which the testator had taken so much interest in endeavoring to advance practical education. The schools designated are the Central and Northeast Manual Training Schools.

The Mountain City Stove Company, Love & Headdon, proprietors, Chattanooga, Tenn., have found it necessary by reason of the large increase in their business to remove to more commodious quarters, which are located opposite their old store on Market street. We understand that in connection with their wholesale department a complete stock of Stoves will be put in to be sold at retail. The company expect to occupy their new quarters about April 1.

The Great Western Stove Works of Leavenworth, Kan., expect to have the annex to their plant completed some time about the middle of June. It will be used principally for a storehouse or as an addition to the main room in the principal building for the manufacture of Ranges. The new structure is 49 x 150 feet in size and four stories and basement in hight. The wing of the main building touching the annex on the west side will be used for the nickel plating department, a new nickel plating plant having been ordered, and will be in operation within the next six weeks or two months. The plant will include a 6 horse-power dynamo, a number of polishing machines and tanks for the plating solution, and will give employment to 20 additional hands.

"We want you to see the new Eclipses for 1898" is the inscription in bold letters on a neat folder which reaches us from the Eclipse Stove Company of Mansfield, Ohio. The illustrations show the Sunrise Eclipse, a new six-hole coal Range with duplex or flat grate, square oven and attractive ornamentation; the Pennant Eclipse six-hole wood Range, embodying the latest improvements, and the Excel Eclipse coal cook, made in three sizes. These goods are referred to by the manufacturers as being first class in all respects, handsome in design and strictly up to date.

One of the buildings occupied by the Great Western Stove Repair Company, Minneapolis, Minn., was pretty well demolished by fire on March 17, the loss including a stock of new Gasoline Stoves. We understand that a portion of the loss was covered by insurance.

The Knoxville Range Company is the name of a concern incorporated a few days ago at Knoxville, Ky., with a capital of $20,000. The Scates Warm Air Furnace Company of the same place were also incorporated, with a capital stock of $40,000. The incorporators of both companies are F. E. Fuller, J. L. Nelson, R. R. Scates, W. A. Hickey and R. L. Culton.

It is stated that J. M. Bridgeford & Co. of Louisville, Ky., are considering the advisability of moving their extensive Stove foundry to another city, and that President Miller and Manager Ogle visited New Albany, Ind., the first of the present week for the purpose of looking for a desirable location for their foundry.

The S. Obermayer Company, Cincinnati, Ohio, and Chicago, Ill., manufacturers of Foundry Facings and Foundry Supplies and Foundry Equipments, report business much better than the first part of last year. They have added a new department to their large business, and having secured the services of a foundry equipment expert are now in a position to figure with parties on the entire building of a brass or iron foundry, from the ground up completing it with the latest and most improved equipments. The S. Obermayer Company will also furnish plans of foundries showing the most economical plans of operating them. They are large importers and refiners of East India Plumbago or Silver Lead or Graphite.

By reason of a misunderstanding between the State Board of Control and J. Loewenberg & Co., lessees of the Northwest Stove Foundry at Salem, Ore., operations at the foundry at the Penitentiary were recently suspended.

The Gurney Foundry Company, Limited of Toronto, Canada, have brought out a line of heavy steel plate Ranges, known as the John Bull, which are referred to as being especially adapted for hotels, hospitals, convents and public institutions. These Ranges, we are informed, are made of the best wrought steel, the plates exposed to the direct action of the flame being covered and protected by asbestos. The company also manufacture an extensive line of Steam Jacket Cookers, Steam Roasters and Steam Vegetable Kettles for hotels and public institutions.

The Hill & Griffith Foundry Supply Company, Cincinnati, is the style name of a new firm who have secured premises immediately adjoining the William Resor Company's Foundry on the Cincinnati, Hamilton & Dayton Railroad. The main building is of brick, three stories in hight, 40 x 120 feet. The cellar will be used for the reception of raw material, which is thrown in through chutes direct from the cars There will also be located the crushers and drying pans. The first floor will be devoted to the packers, of which there are four, and to the shipping department. At the south end of this floor a one-story addition, 30 x 100 feet, will be utilized for the storage of small supplies. The second floor is divided up into offices, warerooms and the milling department and bolting chests. The third floor will be entirely given up to storage purposes. The engine and boiler plant will be located in a separate structure, also of brick, two stories in hight, 33 x 68 feet, the ground floor being occupied with two 5 x 8 Greenwald boilers and a 300 horse-power Greenwald engine. The upper floor, connected by a bridge with the main building, will be given up entirely to the men's bathroom. The entire premises cover approximately 250 x 250 feet, and are admirably adapted for the purpose. Both Mr. Hill and Mr. Griffith are so well and favorably known to the foundrymen throughout the country as to preclude the necessity for any special

mention. The new concern start up with ample facilities.

The Palermo Mica Company, 27 Peck slip, New York, will shortly occupy the premises at 115 Beekman street, near Water, which are now being thoroughly overhauled and renovated for the company's accommodation.

The Eclipse Gas Stove Company, Rockford, Ill., have issued a little pamphlet with a bright red cover, which everybody who gets it is warranted to read through before he lays it down. It is entitled "The Old Fashioned Kitchen," and contains a number of poems contrasting the old days with the modern era, in which the Gas Stove, of course, plays a conspicuous part. The illustrations are of a highly original character, made expressly to suit the poems.

The Excelsior Steel Furnace Company, 38 and 40 West Monroe street, Chicago, have issued a handsomely printed illustrated circular setting forth the special features of their Sectional Double Wall Pipe, of which they are the exclusive manufacturers. Heavy buff colored paper is used with green ink.

A press dispatch of March 24 from Dayton, Ohio, states that the Craig-Reynolds Foundry Company's shops in North Dayton were flooded with 10 feet of water which reached some carbide of calcium. This formed acetylene gas, causing several explosions and a fierce blaze. The fire department had to fight the flames from boats. The damage is estimated at $10,000.

Rumors are afloat in New York to the effect that recent information from South Africa says that "specifications and plans are wanted for the erection of an electric lighting and tramway scheme in East London." As the matter now really stands, for a considerable length of time the people of East London have been desirous of having some private corporation invade their town and, in view of liberal franchises and concessions, build an electric tramway and lighting station. It will be necessary for the company, if found, to bear the cost and risk of the entire undertaking, as there is no one in East London who is willing to invest in the scheme. East London is beautifully situated on the coast of South Africa, and it is the object of the people to make it more of a convenient summer resort by lighting it with electricity and running electric tramways through the city and to outlying sections. A large South African machinery house prepared specifications and bids for the furnishing of these plants some time ago, but the city refused to attempt the undertaking, as it had not sufficient sums. It now seems as though the people were again trying to get some American corporation to carry out their schemes and bear the expense and risk of the undertaking. Other electrical operations which are more liable to take place are the erection of an electric light plant at the Monastery Diamond Mine, Orange Free State, and the substitution of an electric tramway for the present steam road at the Sheba Gold Mines.

A New York journal had it last week that an order had just been placed with a New York office of a pipe mill for 5000 tons of wrought iron pipe for South Africa. The facts of the case are that an inquiry from South Africa for 5000 tons of wrought iron piping has been causing considerable excitement among the trade, but when the real order put in an appearance it called for less than one-tenth of the amount on which prices were asked. In other words, the inquiry which caused all the trouble brought forth an order for slightly more than 400 tons of piping. A manufacturer in the Pittsburgh district, with New York offices, captured the order. Business in this line indicates a good near future, as the demand is increasing steadily. There is no change in values.

President Almeric H. Paget of the Chihuahua & Pacific Railroad Company has signed a contract with the Nassau Construction Company of New York City for the construction of a steam railroad in Mexico, from the sea to the silver mining regions of that country. The total distance from Chihuahua to the Gulf of California is 350 miles, and under the terms of the contract 120 miles are to be completed before November 1. The contract is said to be the largest made in this country for steam railroad construction since 1893.

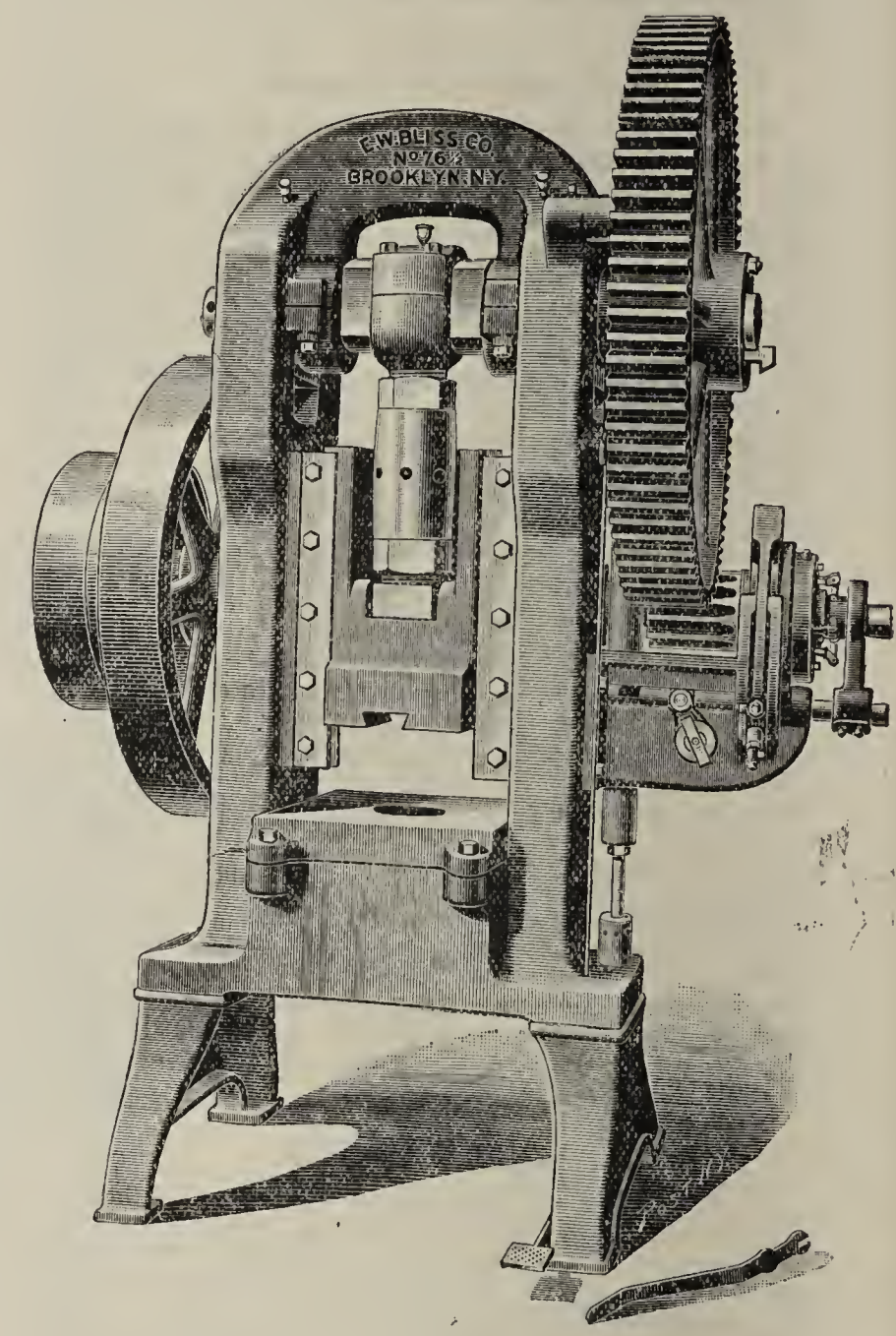
The works at Lorain, Ohio, have lately taken an order for some street railroad work at Jamaica, and are building complete a street railroad plant, girder rails, special work, &c., for Brazil, the only exception being the cars.

The Baldwin Locomotive Works of Philadelphia have received an order for 15 heavy Mogul type freight locomotives for the Egyptian State Railway. The engines are to be shipped early in May.

The Bliss Straight Sided Power Press.

The machine shown in the accompanying engraving embodies the modifications which the E. W. Bliss Company of 16 Adams street, Brooklyn, have made in their regular line of straight sided presses. These presses are especially adapted for work requiring heavy pressure, such as stamping, punching, blanking and shaping, required in the manufacture of such articles as bicycle crank hangers, pedals, sprockets, saddles, &c., skates, sewing machines and locks. They are also applicable for trimming drop forgings, either hot or cold, in which case they are supplied with a side punch, as shown in the engraving. This punch is used for cutting off purposes.

The shafts are of very large diameter. An automatic clutch insures immediate response to the treadle action. The shaft may be turned back to release the punch if stuck in the die, and it may be locked, so that for safety



The Bliss Straight Sided Power Press.

it is not necessary to throw off the belt when setting dies. The automatic friction clutch used when the presses are geared obviates the difficulties experienced with positive automatic clutches in such machines. It acts instantaneously and avoids entirely the heavy shock which in positive clutches tends to destroy the clutch parts. The large gear wheel, instead of revolving continually, is with these clutches keyed to the shaft and at a standstill until the clutch is brought into action. This constitutes an additional advantage in the saving of considerable wear. Otherwise the clutch acts as usual, causing the shaft to make one revolution and stop automatically at the highest point of the stroke. A cam stripper is applied to these presses when used for piercing and stamping. This type of machine is made in a number of sizes, either with fly wheel or geared, as the nature of the work may require.

A sweeping anti-trust bill was passed last week by the Kentucky Legislature which under the penalty of forfeiture of charter prohibits combinations of persons or corporations organized for the raising or lowering of the price of any article so as to prevent competition in any line of trade or to create or carry out restrictions on trade, or to limit or reduce the production of merchandise, commodities, &c.

TRADE REPORT.

METAL MARKET.

Pig Tin.—The metal has been quiet during the past week. Purchases were fair in amount and generally for consumptive account. Prices have advanced slightly, largely in sympathy with higher quotations from London. Arrivals during the week have been light, and the quantity afloat and due here this month will hardly be sufficient to fill the demand for consumption. The market was very steady at the close. Jobbers quote Straits Pig in retail quantities at 15c. to 15¼c. per lb.

Copper.—The market here has been quiet, with no large sales, but a fair run of moderate sized purchases. The absence of spot Copper keeps prices as firm as ever. In London there was quite a smart advance during the week. Some good export shipments have been made on large contracts made previously, the total amount sent abroad reaching 8500 tons so far this month. Very few new sales for export have been made. All varieties of the metal remain quite firm. Lake Ingot in small lots from stock is quoted at 13¼c. per lb., and Ansonia Grade Casting Copper at 12½c.

Sheet Copper.—Prices remain firm and the consumptive movement shows improvement. In retail quantities from store Sheet Copper is generally quoted at 16c. per lb., basis.

Pig Lead.—There has been a change for the better in this metal during the past week. Consumers show more disposition to buy, while holders are less anxious to sell. As a consequence, wholesale prices have stiffened from 2½ to 5 points. Some good business is understood to have been put through within the past few days, and the tone of the market generally is better, although it cannot be said to be notably active. Small lots of American Pig from store are quoted by jobbers at 4⅛c. to 4¼c. per lb

St Louis advices are as follows : The market has eased off somewhat during the past week. Offerings have been quite free and buyers have been slow to purchase, and a weakening tendency in the price is quite evident.

Spelter.—Is very firm and prices show an inclination toward advancing. Consumers have come into the market recently and made large purchases, while the production if anything is at the present time a little behind the consumption. Large exportations to Europe also tend to stiffen the market, which is advancing on the other side. The outlook is regarded as bright for better prices and an active demand. Jobbers' prices for good Western brands in retail lots rule at about 4.65c. to 4¾c. per lb.

St. Louis advices are as follows : There is no change to note in this metal. At last week's prices buyers seem willing to purchase, especially so as there is very little offered at these prices. Stocks are light and are kept so by the shipment of liberal quantities for export.

Antimony.—The market is characterized by great firmness. The demand is fairly active and stocks somewhat light. Small parcels from stock are usually quoted at 8½c. per lb. for Cookson's, 8c. to 8¼c. for Hallett's and 7½c. to 7¾c. for Japanese.

Nickel—There is a heavy demand for this metal at present, and prices have shown a tendency to mount up. Small lots are generally quoted at 37c. to 38c. per lb.

Aluminum.—A fairly active demand continues for this metal and prices remain unchanged as follows : No. 1 Aluminum, guaranteed over 99 per cent. pure, in Rolling Ingots, is quoted in small lots at 40c. per lb.; 100-lb. lots, 36c.; No. 2 Ingot, guaranteed over 90 per cent. pure, is quoted in small lots at 34c. per lb.; 100-lb. lots, 33c., and special Casting Alloy, containing over 80 per cent. pure Aluminum, used in place of Brass, 35c. per lb.; 100-lb. lots, 30c.

Tin Plate.—It can hardly be said that this market shows any tangible improvement, for the volume of business has been very moderate in the past week, and recent contracts have been placed at prices which show no improvement over the low level that has ruled for some weeks. Yet there seems to be rather more confidence in the trade as the season advances, and it is felt that the large consumers in the canning trade must shortly come into the market. The temporary stoppage of some of the mills on account of floods, and the renewed difficulty in obtaining prompt supplies of steel, which is hindering operations in a few works, are likely to involve delays in deliveries as well as more or less restriction in the current month's production. This is a factor which should tell on the market, and with any rush of orders may tend to create a shortage later on. The stiffening of the raw material is also a "bull" factor. On these grounds many in the trade look forward hopefully to better prices and an enlarged demand in the near future. Meanwhile uncertainty regarding the proposed consolidation and the prevailing war talk are undoubtely keeping back purchasers. The retail trade shows some improvement with the advance of the season, and jobbers in this quarter are holding their prices for small lots fairly firm. Moderate sized quantities of American Plates for spot delivery at New York, Philadelphia and Baltimore are quoted about as follows: American Coke Tins, IC, 108 lbs., 14 x 20, Bessemer Steel, $3.50 to $3.60; do., 100 lbs., $3.40 to $3.50; do., 95 lbs., $3.35 to $3.45; do., 90 lbs., $3.30 to $3.40; American Charcoal Brights, Melyn Grade, IC, 14 x 20, $4.75; Allaway Grade, IC, 14 x 20, $4.25; American Charcoal Ternes, IC, 14 x 20, ordinary, $3.50 to $3.60. There is no change in the position of Foreign Plates, which are selling slowly at prices which remain largely nominal.

Sheet Iron.—The demand for Sheets continues fairly free. Some good sized orders for Black Sheets have been placed in the past week, and the mills, as a rule, are well sold up for some time to come. Some mills are refusing orders for future delivery at the current prices, in view of the advancing tendency in Steel and the difficulty in securing sufficient supplies of the raw material. Yet retail prices do not respond to these influences, remaining low and unsatisfactory. Galvanized Sheets are in active demand, and prices are somewhat firmer. Jobbers in this quarter quote small lots of No. 27 Common Black Sheets at 2.40c., and Galvanized Sheets at 80 per cent. off the list.

Chicago advices are as follows: Manufacturers' agents report a light demand for Black Sheets, which are weaker owing to the efforts made by some of the mills to unload accumulated stocks. Galvanized Sheets are more active, with some heavy transactions. Jobbers continue to quote small lots from stock at 2.30c. to 2.40c. for No. 27 Black and 80 and 2½ to 80 and 5 per cent. off for Galvanized.

Old Metals.—The market shows little change. An active demand still exists for Scrap Copper and Brass for domestic consumption, but Scrap Iron is rather quieter. Prices show no quotable change. Yard dealers in this city and vicinity are paying the following rates for moderate sized lots, delivered here:

Heavy Copper	per lb. 9⅞c.
Light and Tinned Copper	per lb. 9¼c.
Heavy Brass	per lb. 6½c.
Light Brass	per lb. 5½c.
Lead	per lb. 3½c.
Tea Lead	per lb. 3¼c.
Zinc	per lb. 3 c.
Zinc Dross	per lb. 2.70c.
Zinc Skimmings	per lb. 1.10c.
Sal ammoniac Skimmings, per ton	$20 to $24
No. 1 Pewter	per lb. 8 c.
No. 2 Pewter	per lb. 4½c.
Wrought Scrap Iron, per gross ton	$8 25
Heavy Cast Scrap, per gross ton	8.25
Stove Plate Scrap, per gross ton	5.75
Burnt Iron, per gross ton	4.25
Tin Plate Scrap, per ton	2 25

THE IRON MARKET.

There never was a time when, generally speaking, the Iron and Steel plants in the United States were as fully employed as they are at the present. One of the largest works in the West has actually been forced to buy a little Steel in the open market, its own enormous output being inadequate. Another great plant expects to turn out close to 200,000 tons of Ingots in the month of March. With isolated exceptions, the modern Steel plants in the United States are rushing and there is considerable complaint among consumers of delays in deliveries.

With cloudless political skies, there could be but one inference to draw from this state of affairs, coupled with the fact that order books are well filled for months to come. But prolonged apprehension concerning our relations with Spain, or actual rupture, would check a very large amount of constructive work and bring out cancel lations compared with which orders for war material

would fade into insignificance. War might afford opportunities for speculators, but the majority of manufacturers would suffer, and our growing export trade might collapse entirely.

As yet, however, the Iron trade has been proceeding serenely and the movement toward harmonizing contending interests goes on. The Western Wire consolidation is practically concluded, though it may yet gather additional smaller concerns into its fold. It is understood that the sales territory is to be divided into three districts, the Eastern, Central and Western, each handled by a general manager. The course of the markets in the near future may be dependent upon the attitude assumed by the large outside interests.

There is a movement on foot to interest all the leading producers of Foundry Iron South, East and West in some scheme to restrict production; or, in other words, render comprehensive the arrangement talked of by the majority of the Alabama and Tennessee makers. With the frayed reputation of all "gentlemen's agreements" on the one side, and the fear of collision with Federal authorities on the question of trusts on the other, any success must be regarded as a remarkable *tour de force*. The conviction is growing, not alone among producers, but also among buyers, that nothing short of actual consolidation can keep contending interests up to a mark, however sharply drawn and carefully fenced in.

One of the latest schemes, which it is believed has chances of success, is to get the Mesaba Ore interests to unite in advancing prices. This would probably prove of most interest to the furnace plants making foundry irons.

It is gratifying to note that a very good tonnage of orders is steadily coming out, but the nerve of manufacturers has been shaken by the recent proofs of a wonderful elasticity in productive capacity, and prices therefore remain at a low level.

Pig Iron.—The market in New York and vicinity continues irregular as to prices and quiet so far as new business is concerned. There has been some movement in Southern warrants. We note some large sales of special Charcoal Iron for army and navy work. We quote as follows: Northern brands, No. 1, $11 to $11.50; No. 2, $10.50 to $11; No. 2 Plain, $10 to $10.50. Southern brands, same delivery: No. 1, $10.75 to $11.25; No. 2, $10.25 to $10.50; No. 1 Soft, $10.75 to $11.25; No. 2, $10.50 to $11.

In the Chicago market, inquiries continue to come up and a great deal of Iron is still to be bought to satisfy consumers. It is evident, however, that it must be had at a reasonable price. Buyers will not pay advanced rates, except for small lots for special purposes. The Southern producers are apparently willing to meet buyers' views in this respect. They are keeping their prices down, and some companies outside of the Southern combination are reported to be shading the regular schedule. The transactions of the week covered a good tonnage in the aggregate, but the largest deal is reported to have involved only 500 tons. The local furnace companies are almost out of the market, holding prices so far above ordinary rates as to check business which would naturally come to them. A moderate movement is taking place in Charcoal Iron, but no large transactions have recently transpired in this line. We quote for cash as follows:

Lake Superior Charcoal	$12.00 to $13.00
Local Coke Foundry, No 1	11.50 to 12.50
Local Coke Foundry, No. 2	11.00 to 12.00
Local Coke Foundry, No. 3	10.50 to 11.50
Local Scotch, No. 1	11.50 to 13.00
Ohio Strong Softeners, No. 1	12.00 to 12.25
Southern Silvery	11.25 to 11.50
Southern Coke, No. 1	11.00 to 11.25
Southern Coke, No. 2	10.35 to 10.70
Southern Coke, No. 3	10.10 to 10.40
Southern, No. 1 Soft	10.85 to 11.00
Southern, No. 2 Soft	10.35 to 10.70

Philadelphia advices as to Pig Iron indicate that it is a very hard market to quote. Some get more money than they could get earlier in the month, others have to take a little less. The only explanation of this is that some Irons are comparatively scarce, others are too plentiful, consequently prices have to be adjusted according to circumstances. Sales of No. 2 X have been made at $11.25, more at $11 and at $10.75, and some at less than $10.75. Still if the market is fairly averaged it will be found that more business is being done and that prices are not lower unless quality is in proportion. There is an impression that things are getting into better shape, and while the indications in this respect are not very distinct the chances of improvement are not without some foundation. The range for all grades is about as follows, with the usual rebate according to freights at points within a radius of 100 miles south or west: No. 1 X Foundry, $11.75 to $12; No. 2 X Foundry, $10.75 to $11; No. 2 Plain, $10.40 to $10.50.

In the Pittsburgh market Bessemer Pig is held firmly. There has not been much trading done buyers holding off to await the outcome of the plans for the new Pig Iron Association, the final details of which are nearly completed. Foundry Irons are very dull. We quote, f.o.b. cars Pittsburgh: No. 1 Foundry, $10.40 to $10.50; No. 2 Foundry, $9.90 to $10; Bessemer, $10.40 to $10.65, depending on delivery.

The feeling that Iron will go lower if it changes at all seems to dominate the Cincinnati market just now. Beyond supplying immediate needs buyers will not figure, and as a consequence there has been nothing doing except in a retail way, with the aggregate something below the average. Machine shops, agricultural works and general foundries are all very busy, and it is reported that there is a demand for Malleable Castings, which the plants in this section are unable to supply. There is no complaint regarding car service and deliveries are holding up remarkably. Thus while new business is dull and immediate prospects for trade not good, the general situation is very satisfactory. Quotations are nominally unchanged, and in the absence of any test on the part of buyers may be said to be steady. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$9.75 to $10.00
Southern Coke, No. 2	9.25 to 9.50
Southern Coke, No. 3	9.00 to 9.25
Southern Coke, No. 1 Soft	9.50 to 9.75
Southern Coke, No. 2 Soft	9.25 to 9.50
Southern Coke, Gray Forge	8.50 to 8.75
Southern Coke, Mottled	8.50 to 8.75
Ohio Silvery, No. 1	12.00 to 12.50
Ohio Silvery, No. 2	11.50 to 12.00
Lake Superior Coke, No. 1	11.00 to 11.50
Lake Superior Coke, No. 2	10.50 to 11.00

There is nothing in the St. Louis Pig Iron situation to encourage sellers, as consumers continue to buy as their immediate needs require and cannot be induced to change this policy. Sales during the week were light, being largely confined to carload lots, with an occasional order for 100 tons. We quote as follows for cash, f.ob. cars St. Louis:

Southern, No. 1 Foundry	$10.00 to $10.50
Southern, No. 2 Foundry	9.75 to 10.00
Southern, No. 3 Foundry	9.50 to 9.75
No. 1 Soft	9.75 to 10.00
No. 2 Soft	9.50 to 9.75

CHICAGO REPORT.

Scrap.—Business has latterly been quiet. Consumers seem to be well supplied. Yard dealers' buying prices are as follows, Chicago delivery:

	Per net ton.	Per lb.
Country Wrought Scrap	$7.00	....
Machinery Cast	7.50	....
Malleable Cast	6.50	....
Stove Plate (free of burnt)	5.50	....
Burnt Iron and Grate Bars	3.75	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	2.50	....
Old Boilers—whole (Iron)	3.50	....
Old Boilers (Iron)—cut in single Sheets and Rings	6.50	....
Old Gas Pipe and Boiler Tubes	6.00	....
Cast Borings	3.25	....
Turnings	4.50	....
Horseshoes	8.50	....
Copper Wire and Heavy	....	10¼c.
Copper Bottoms	....	9¼c.
Copper Clips	....	10 c.
Red Brass	....	8½c.
Yellow Brass	....	7½c.
Light Brass	....	5¼c.
Pipe Lead	....	3 c.
Tea Lead	....	3 c.
Zinc	....	3¼c.
Rubber	....	4 c.
Inside Bicycle Tubing	....	10 c.
Outside Tubing	....	3½c.
Rubber Hose	....	1 c.

Anthracite.—The market is dull. The prices of carload lots of 12 tons minimum are as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	7.00	7.25
Council Bluffs, Iowa	7.00	7.25
Lincoln, Neb	7.15	7.40
Sioux City, Iowa	7.50	7.75
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.00	7.25
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	7.00	7.25
Leavenworth, Kan.	7.00	7.25
Omaha, Neb	7.00	7.25

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$6.50
Pueblo	6.50
Colorado Springs	6.50
Leadville	6.50
Cheyenne, Wyo	7.50
All points between Denver and Missouri River	7.00

THE HARDWARE TRADE.

With the advance of the season there is an increasing movement in spring goods, and in some of these lines trade is referred to as large and satisfactory. This is especially the case in the West, where business is active, with an excellent outlook for the summer. There is also more trade in Builders' Hardware and Tools, which it is hoped will increase as the season progresses. With the announcement of the practical abandonment of the efforts which have for so long a time occupied the attention of the trade looking toward the consolidation of the Wire Rod and related interests, the apparent successful organization of the American Steel & Wire Company is a fact of some importance. It is the aim of the large companies whose interests are thus consolidated to control as far as they can the market for Wire Nails, Barb Wire, &c., anticipating the accession of some other companies to their organization, and hoping also for the general maintenance by their leading competitors of the prices which they may establish. It is thought likely that the effect on the market will thus be felt in the announcement of somewhat higher prices on these lines. There is no doubt that the talk of foreign complications has the effect of retarding business, as merchants and manufacturers are unwilling to engage in new enterprises of moment with the possibility of disturbance in business conditions. Reports, on the whole, from the different trade centers are encouraging, but business in New England and the East generally continues somewhat backward as compared with that of other portions of the country.

Advices from Chicago.—Shelf Hardware jobbers report a still heavier business, the demand having increased considerably during the week. New stocks have been an important feature. Mail orders show a decided gain. The movement from retailers is so rapid that buyers cannot wait until the visits of salesmen. The demand is particularly heavy for seasonable goods, such as Poultry Netting, Screen Doors and related articles, in which the movement is stated to be in excess of that of any previous year. A very good trade, however, is noted in general Shelf Hardware. Building operations throughout the country are evidently on a larger scale than for some years, and Builders' Hardware is consequently in good demand. Staple goods are also being shipped freely. The movement of Wire Nails and Barb Wire is steadily increasing. Some changes are being made in prices, particularly in Bolts, Nuts and other heavy articles. Carriage Bolts have been marked up by the manufacturers during the week to 75 and 10 and 10 per cent. Heavy Hardware jobbers are also feeling an increased movement and report a very good demand, not only for Wagon and Carriage Stock, but also for Iron and Steel.

Advices from St. Louis.—The Hardware jobbing trade enjoys a continuance of the activity which has characterized the market since the opening of the year. The West and Southwest are buying more liberally than for years past, and that these goods are being marketed is evident by the heavy increase in telegraph orders. The spring trade has set in early and gives promise of continuing late. Garden Tools are being ordered in very liberal quantities and such staples as Nails and Barbed Wire, Screws, Bolts, &c., are very free sellers. Copper goods are active and prices higher. Galvanized Iron and Tin Plates are also active. Reports from all jobbers indicate that in Builders' Hardware the present year will likely prove a record breaker and some houses find it difficult to keep up their assortment in this line, so heavy is the demand.

NOTES ON PRICES.

Wire Nails.—The Wire Nail market is, so far as prices are concerned, in substantially the same condition as a week ago, though there has been perhaps a slight yielding in quotations. The volume of business, however, has not been heavy, the trade maintaining a waiting attitude with a view to seeing what the course of the market will be. The important fact in this connection during the past week has been the practical consummation of the negotiations referred to in our last issue between the Consolidated Steel & Wire Company, the Salem Wire Nail Company, the American Wire Nail Company, I. L. Ellwood Mfg. Company, HP Nail Company and American Wire Company. These companies have, it is announced, reached an agreement which results in their practical consolidation under the name of the American Steel & Wire Company, the formal consolidation awaiting the expiration of the options, terminating April 1, which were given to those identified with the movement for amalgamating the Wire Rod interests. It is understood to be the intention of the consolidated companies to make an advance in the price of Nails and Barb Wire with the expectation that the leading manufacturers outside of this organization will maintain prices. The effect of this unifying of the interests of so many prominent manufacturers will, it is anticipated, have a good effect on the market, diminishing competition and making it an easier matter to hold up prices to a level that will be at least profitable. Prices in the New York market are substantially the same as last week, small lots from store being quoted at $1.65 to $1.70.

Advices from Chicago.—It is settled that Chicago will be the headquarters of the new American Steel & Wire Company formed last week. The policy of the new consolidation is awaited with a great deal of interest. Hardware jobbers are completely at sea, but the general opinion inclines to the view that not much change will be made in prices, if any. Meanwhile the market from first hands is rather quiet. Jobbers probably have enough Nails to carry them over for a few weeks and will await developments. Jobbers quote small lots from stock at $1.55 to $1.60, and report a very good demand from the retail trade.

Advices from St. Louis.—The Wire Nail market continues quite active and prices are decidedly firmer than heretofore. No unusual advance in Wire Nails is anticipated as a consequence of the consolidation, but as most producers have been complaining for several months past that the price of Wire Nails was pretty close to cost, a moderate advance over the prices ruling to-day will be in order.

Cut Nails.—The Cut Nail market continues uniform and devoid of special feature. The price which has prevailed for some time is pretty regularly maintained. The volume of business is fair, but does not as yet exhibit the increase which was anticipated at this time.

Advices from Chicago.—Prices are a little easier now and small lots from stock are to be had at $1.40 to $1.45.

Advices from St. Louis.—The demand for Cut Nails does not show any improvement and manufacturers are making some extremely close prices to secure business. Jobbers are selling small lots from store at $1.35 to $1.40, base.

Barb Wire.—The Barb Wire market is practically unchanged in the matter of prices. The organization of the American Steel & Wire Company has not as yet had a perceptible effect on the market, but it is hoped by those interested in the movement that higher prices will soon be announced and maintained. The attitude of outside manufacturers has obviously much to do with the success of the plan, but assurances have been given that the consolidation prices will be maintained as far as possible.

Advices from Chicago.—The same influences are operative in the Barb Wire trade as above referred to under the head of Wire Nails. The market is quiet at present. Manufacturers report that all of them have light stocks on hand and that jobbers are by no means supplied with contracts to cover their spring requirements. Small lots from stock are selling at $1.65 for Painted and $1.95 for Galvanized.

Advices from St. Louis.—There is no cessation in the demand for Barb Wire and prices are being maintained without any particular effort. Jobbers ask $1.70 to $1.75 for small lots of Painted Wire, with the usual advance for Galvanized.

Wrought Iron Pipe.—The market for Wrought Iron Pipe has weakened somewhat in the past week, and slight concessions are made from the prices quoted a week ago. Dealers name four 10's extra beyond the base prices for small lots.

Glass.—There is no change in the local Window Glass market, limited demand being the rule, at 85 and 15 per cent. discount. Reports from association factories indicate that they are getting a fair amount of business and that Glass is not being stocked at factories. The output of most, if not all, independent factories is contracted for or controlled by jobbers.

White Lead.—The improvement noticed last week for White Lead in oil keeps up in a moderate way, but is more pronounced in the West than East. Prices remain the same. Terms are also unchanged. A fair amount of business is being done in Dry Lead.

Linseed Oil.—There is somewhat of an improved demand as the season progresses, representing a fair average spring distribution. Out of town competition is keen, affecting the tone of the market unfavorably. The recent slow but continued decline in the prices of raw material also has a weakening tendency. Prices, however, are without change.

Spirits Turpentine.—Prices during the past week have shown a further decline, retail prices for single barrel lots being quoted at about 35c. Large buyers are holding back until a freer movement of the new crop still further reduces values Business is confined to moderate purchases for current needs.

TRADE NOTES.

The Viaduct Brass Works, Cleveland, Ohio, are to be dismantled and sold out.

The New Jersey Aluminum Company, Newark, N. J., have removed from 60 Arlington street to larger quarters at 350 Plane street. The change has been rendered necessary by the increasing business of the concern.

The Joseph Dixon Crucible Company, Jersey City, N. J., issue an interesting leaflet on friction and lubrication containing much information, among other things a summary of tests conducted by Professor Thurston comparing graphite lubricants with the best sperm oil, very much to the advantage of the former.

The Whitely Mfg. Company of Camden, N. J., have been incorporated, with a capital of $300,000, to produce Metal Goods of all descriptions. The incorporators are William N. Whitely of Springfield, Ohio ; William T. Stillwell of Baltimore, John R. Williams of Merchantville, N. J., and W. N. Gibbs and George S. Graham of Philadelphia.

It is probable that the armor plate mills of the Carnegie Steel Company, Limited, at Homestead, Pa., will be started up within a short time. Work will then be started on the order for armor plate recently secured by this concern from the Russian Government.

The report of the sinking of the steampship "Coya" of the William R. Grace & Company's lines which was circulated last Saturday has caused much excitement among New York machinery houses. The freighter was bound for the western coast of South America and had a large amount of American machinery on board. It has developed since the report of her sinking, however, that the news must have been erroneous, as in consideration of the time of her leaving New York and the point where she was supposed to have sunk all conflict with her schedule. The company's officers assert that she could not have reached the spot where she was reported to have been seen submerged at the time reported. The general belief therefore, is that it must have been a wreckage other than the "Coya" which was seen last Saturday.

The Minnesota Iron Company have declared a quarterly dividend of 1½ per cent., payable April 15. Transfer books close March 31. It is stated that the company did not originally intend to commence paying dividends until July, but the year 1897 was a very profitable one and justified such action at an early date. The large expenses for improvements for lake steamers for several years past have all been made out of earnings, and there was no reason why stockholders should not begin to receive a part of the surplus earnings. There is little doubt that business this year will be larger than last, as far as sales of ore are concerned, and it is anticipated that the profit per ton will also be larger. There is no apparent reason why 6 per cent. dividends cannot be maintained, as the company are fully equipped in every department to do a larger business than they have ever had.

D. H. Smalley & Co. of Aurora, Ill., manufacturers of hand power punches and shears, have just completed the fifth new pattern machine since July last, which will be known as the Aurora punching machine No. 9. In this machine the lever works forward, enabling one man to feed and operate it conveniently. This pattern will punch up to a ½-inch hole in ⅜-inch iron or steel. The punches and shears made by this firm are of more than ordinary interest to jobbers and dealers. They are not only modern and well built, of unusual power and capacity, but are sold at a moderate price. The advertisement of this firm will be found in another part of this issue.

Edward Miller & Co., Meriden, Conn., whose extensive line of bicycle sundries has been recently shown to the wholesale trade in all parts of the country, now includes the A1 bicycle lamp, Everlit bicycle lamp, Miller's beacon light, Royal beaded bell and Burdick cyclometer. We are advised that this line is meeting with much favor in the hardware trade, and many retail dealers in all parts of the country are now handling the goods. Edward Miller & Co. have been manufacturers of lamps for many years and their factory is one of the largest and best equipped in the country for light metal work. The plant was established in 1844 and the experience gained by a long period in manufacturing has been utilized in making their line of bicycle sundries as perfect as possible.

The Edward J. Brandt-Dent Company, Watertown, Wis., are manufacturing the Brandt automatic cashier, which is somewhat similar in appearance to the well known cash registers, but has its own distinctive features. It is made in several styles, the largest one accomplishing the payment of any amount from 1 cent to $5, giving the usual divisions of change, by depressing but one key. The operator makes no selection of coin and does no counting. He merely depresses the key calling for the amount needed and the change is instantly and correctly made. Other machines make change up to $1 or the fraction of $1, down to 1 cent or in multiples of 5 cents, &c.

The Schenectady Locomotive Works, Schenectady, N. Y., have received an order for 12 locomotives for the Kiu Shiu Railroad of Japan. This is a duplicate of a similar order completed for the same railroad last year. The locomotives are to have cylinders 16 x 24, and are to be 3 feet 6 inch gauge.

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Metal and Miscellaneous Prices.

CHICAGO, MARCH 24, 1898.

Tin—

Straits pigs.....15¾@16¢

American Tin Plates—

American Base Box Quotations.

Based on 32,000 square inches in a box, which is exactly 2 per cent. more than in the English base box of 14 x 20 Tin Plates. The American base box weighs 110 ℔ and the English base box 108 ℔.

Highest Grade Charcoal—Bright.

Size.	Base.	Contents.	Per box.
10 x 14,	110-℔	...240 sheets	.....$5.65
"	140-℔	" "	..... 7.25
12 x 12,	110-℔	" "	..... 5.75
"	140-℔	" "	..... 7.50
14 x 20,	110-℔	....120 "	..... 5.65
"	140-℔	" "	..... 7.25
"	160-℔	" "	..... 8.85
"	180-℔	" "	.....10.45
"	200-℔	" "	.....13.15

20 x 28 double the price of 14 x 20.

12½x17,	140-℔	....120 sheets	..... 5.35
"	180-℔	" "	..... 6.95

Second Grade Charcoal—Bright.

10 x 14,	110-℔	....240 sheets	..... 5.10
"	140-℔	" "	..... 6.15
12 x 12,	110-℔	" "	..... 5.25
"	140-℔	" "	..... 6.30
14 x 20,	110-℔	....120 "	..... 5.10
"	140-℔	" "	..... 6.15
"	160-℔	" "	..... 7.25

20 x 28 double the price of 14 x 20.

Highest Grade Coke—Bright.

10 x 20,	110-℔	....240 sheets	..... 5.75
12 x 12,	110-℔	" "	..... 4.15
"	140-℔	" "	..... 4.95
14 x 20,	110-℔	....120 "	..... 4.00
"	140-℔	" "	..... 4.85

20 x 28 double the price of 14 x 20.

20x26½,	110-℔	....120 sheets	..... 8.00
20x29½,	110-℔	" "	..... 8.85
20x32½,	110-℔	" "	..... 9.90
"	140-℔	" "	.....12.35
20x39½,	140-℔	" "	.... ..15.00

Old English Method Quotations

Charcoal Plates—Bright.

The price of 20 x 28 sizes is double the price of 14 x 20.

		Per box.
Calland or Melyn Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	.. ..$5.25
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	..... 6 75
	IXX, 14 x 20	..... 8 25
	IXXX, 14 x 20	..... 9.75
	IXXXX, 14 x 20	..... 11.25
	DC, 12½ x 17	..... 5.00
	DX 12½ x 17	..... 6.50
Allaway Grade.	IC, 10 x 14 IC, 12 x 12 IC, 14 x 20	..... 4.75
	IX, 10 x 14 IX, 12 x 12 IX, 14 x 20	..... 5.75
	IXX, 14 x 20	..... 6.75
	IXXX, 14 x 20	..... 7.75
	IXXXX, 14 x 20	..... 8.75

Coke Plates—Bright.

		Per box.
Bessemer Steel or equal to J. B. Grade, Full Weight.	1C, 10 x 14 1C, 12 x 12 1C, 14 x 20	..... $3.75
	1C, 10 x 20	..... 5.50
	1C, 17 x 17	..... 7.75
	1C, 20 x 26½	..... 7.75
	1C, 20 x 29½	..... 8.50
	1C, 20 x 32½	..... 9.00
	1X, 10 x 14 1X, 12 x 12 1X, 14 x 20	..... 4.50
	1X, 20 x 32½	..... 12.00

The reduction per box on lighter plates than IC 14 x 20 is as follows:

100 ℔	.....15¢
95 ℔	.....20¢
90 ℔	.....25¢
85 ℔	.....30¢

Terne Plates.

The following prices are for IC 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2.50 per box advance.

	Per box.
Standard Old Style, 36 to 40 lbs. coating...	$13.00@$15.00
Redipped, or Good Old Style, 20 to 30 lbs. coating...	10.50@ 12.00
Worcester Grade, 12 to 14 lbs. coating...	8.00@ 9.00
S T P —— Grade, L 10 to 12 lbs. coating...	7.50@ 8.00
Dean Grade, 8 to 10 lbs. coating...	7.25@ 8.00

Imported Tin Plates—

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
IC, 14 x 28		.....$7.25
IX, 14 x 28	.....$10.00	10.25
IXX, 14 x 28	..... 11.50	12.75
IX, 14 x 31	..... 11.50	12.75
IXX, 14 x 31	..... 13.00	14.00

	Per box of 56 sheets.
IX, 14 x 56	..... 21.00	$12.50
IXX, 14 x 56	..... 24.00	14.00
IX, 14 x 60	..... 23.00	13.50
IXX, 14 x 60	..... 27.00	15.00

Iron and Steel Sheets—

Black.

	Soft Steel.	Refined Iron.
Nos. 10 to 16...₱ ℔	2.00¢	2.20¢
17 to 20...₱ ℔	2 10¢	2.30¢
21 to 24...₱ ℔	2.20¢	2.40¢
25 and 26.₱ ℔	2.30¢	2.50¢
27... .....₱ ℔	2.40¢	2.60¢

Russia, Planished, &c. 100 ℔.

Patent Planished, ₱ ℔, A...	$10.20 ⎫ 5%
Patent Planished, ₱ ℔, B.....	9.20 ⎭ dls.
Craig's Polished Sheet Steel	.....8½¢
U.S. Polished Sheet Steel No. 27 A	5.05¢

Galvanized.

First quality.....dis. 80@80&2½%

Copper—*Ingot.*

Lake	12¾@13¢
Casting Brands	12¼@12½¢

Sheet and Bolt.

New list, net.

Copper Bottoms.

New list, net.

Seamless Brass and Copper Tubes.

Base price, 17½c, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₱ ℔ additional.

Brazed Brass Tubing, (100 ℔ lots). (To No. 19 inclusive).

Discount, 45%.

Plain, ¾ inch up to 2 inch	.....$0.35
Plain, ⅝ inch up to ¾ inch	..... .36
Plain, ½ inch up to ⅝ inch	..... .38
Plain, ⅜ inch up to ½ inch	..... .41
Plain, 5-16 inch up to ⅜ inch	..... .08
Plain, ¼ inch up to 5-16 inch	..... .65
Plain, 3-16 inch up to ¼ inch	..... 1.00
Plain, ⅛ inch up to 3-16 inch	..... 1.50
Plain, 2 inch up to 3 inch	..... .38
Plain, 3 inch and larger	.....Special.
Plain, smaller than ⅛ inch	.....Special.
Bronze and Copper	.....3¢ advance.

Roll and Sheet Brass. (100 ℔ lots).

Discount, 40%.

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure) in ingots for remelting.

Small lots	.. ₱ ℔, 40¢
100-℔ lots	.....₱ ℔, 36¢

No. 2 (guaranteed over 90% pure).

Small lots	.....₱ ℔, 34¢
100-℔ lots	.....₱ ℔, 33¢

Nickel Aluminum Casting Metal.

Small lots	.....₱ ℔, 39¢
100-℔ lots	.....₱ ℔, 35¢

Special Casting Alloy, with over 80% pure Aluminum used in place of brass.

Small lots	.....₱ ℔, 35¢
100-℔ lots	.....₱ ℔ 30¢

Aluminum Rolled Rods, from ¾ to 1 inch diameter.....₱ ℔, 53¢

Aluminum Drawn Rods, from 1-16 to 1 inch diameter .....₱ ℔, 55¢

Aluminum Plates and Sheets, B. & S. gauge.

In lots of 50 ℔ or more. Less quantities, 5¢ ₱ ℔ additional.

Wider than	6-in.	14-in.	24-in.
And including	14-in.	16-in.	30-in.
	₱ ℔	₱ ℔	₱ ℔
Nos. 13 to 19	$0.38	$0.40	$0.43
" 20	.40	.40	.45
" 21 to 23	.42	.42	.47
" 24	.42	.44	.49
" 25	.43	.45	.50
" 26	.43	.46	.55
" 27	.44	.48	.58
" 28	.44	.50	.60
" 29	.45	.52	.65
" 30	.46	.54	.73

Slab Spelter—

Western Spelter.....4½@4¾¢

Sheet Zinc—

600-℔ casks	5¾¢
300-℔ casks	..5.95¢
Loose sheets	.....6¢

Solder—

Half and Half (50 x 50)	.....11¢
45/55	.....10½¢
Extra Wiping	.....9½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson	.....9@9¼¢
Hallett's	.....8½@8¾¢

Lead—

Soft Pig Lead	.....4¢
Bar	.....5¢
Sheet	.....6¢

Leader Pipes—

Corrugated.....80&10%

Eave Troughs—

Galvanized	.....80&25%
IC Terne	.....75&5%
IX Terne	.....75&5%
Double Bead Galvanized Lap Joint	80&25%
Double Bead Galvanized Slip Joint	80&25%
Double Bead IC Terne Lap Joint	..75&5%
Double Bead IX Terne Lap Joint	..75&5%

Elbows—

Adjustable Tin	.....70%
Spiral	.....50&10%
Plain Tin	... 70%
Plain Galvanized	.....70&5%

Valleys—

Galvanized	.....75&5%
IC Terne	..70&15%
IX Terne	.....70&15%

Gutters—

Galvanized Roof	.....80%
Galvanized Quarter Circle, O. G. and Box	.....80%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s revised list 25%, f. o. b. Chicago.

Steel Roofing—

Perfection	.....$2.25 square
Climax	..... 2.20 square
The Lloyd Spanish Tiling	... 4.50 square
W. J. Burton & Co.'s Roll Cap	3.00 square

Subject to discount.

Metallic Shingles—

Cushman's	.....dis. $2.35

Merchant & Co.'s Gothic Shingles.

		10 x 14	14 x 20
IC Tin.	₱ square,	$4.75	$4.50
Galv.	₱ square,	6.25	5.75

Merchant & Co.'s Spanish Tiles—

Copper, 12 oz., 14 x 20, $25.50 square
Tin IC, 14x20, $8.00 @ $14.25 square
Steel, painted, 14 x 20...$7.50 square

Other sizes on application.

W. J. Burton & Co.'s Eastlake Steel—$4.00 square; IC Tin, $4.25; Octagon Fluted Steel, $4.50; IC Tin, $5.00; Gothic Tile, Tin, $9.00; subject to discount.

Berger's Spanish Tiles—

Copper, 12 oz., 14 x 20..$25.50 square
IC Tin, 14 x 20 ..... 8.00 square
Steel Painted, 14 x 20 .. . 7.50 square.

Cortright's Metal Slates—

14 x 20.....$5.25 square
10 x 14..... 5.50 square
7 x 10..... 6.50 square.

Cortright's Victoria Shingles—

10 x 14.....$6.75 square
7 x 10..... 8 50 square

Subject to discount.

Drain Pipe—*Tile.*

Discount from list.....50%.

Paints, Oils, &c.

Deodorized Benzine	.....8 @ 12¢
Iron Paint, Bright Red	.....₱ ℔ 2 ¢
" " Brown	.....₱ ℔ 1½¢
" " Purple	.....₱ ℔ 2½¢
" " Ground in oil, B. Red,	₱ ℔ 6½¢
" " Ground in oil, Red	...₱ ℔ 6½¢
" " Ground in oil, Brown,	₱ ℔ 5½¢
" " Ground in oil, Purple,	₱ ℔ 6½¢
Linseed Oil, Boiled, in bbls	.....43¢
Linseed Oil, Raw, in bbls	.....41¢
Mineral Paints	.....1 @ 3¢
Orange Mineral	..... .12¢
Pure White Lead in Oil	.....5½ @ 6 ¢
Dry White Lead in bbls	.....5 @ 5½¢
Red Lead, American	.....5¼ @ 5¾¢
Red, Venetian, English, dry	..1½ @ 1¾¢
Red, Venetian, in oil, asst'd cans	.....8 ¢
	kegs. 3 to 6 ¢
Sipe's Japan Oil, in bbls., ₱ gal	..... .34¢
Spirits Turpentine, in bbls., ₱ gal	....40¢
Asphaltum, Trinidad Refined, ₱ ton	.$45
Tarred Felt, 1 Ply, ₱ 100 ℔	.....$1.25
Tarred Felt, 2 Ply, ₱ roll 108 sq. feet	90¢
Tarred Felt, 3 Ply, ₱ roll 108 sq. feet	.....$1.25
Roofing Pitch, ₱ bbl of 300 ℔	.....$3.00

NEW YORK, MARCH 25.

The following quotations are for small lots:

Aluminum—

No. 1 Aluminum (guaranteed over 99% Pure), in ingots for remelting.
Small lots.....₱ lb, 40¢
100-lb lots.....₱ lb, 36¢
Aluminum Rods, from ¾-in. diam. to 1 in. diam.....₱ lb, 53¢
Aluminum Sheet, B. & S. gauge. In lots of 50 lbs or more.

Wider than.....	6-in.	14-in.	24-in.
And including.....	14-in	24-in.	30-in.
	₱ lb	₱ lb.	₱ lb.
Nos. 13 to 19.....	$0.38	$0.40	$0.43
" 20.....	.40	.42	.45
" 21 to 23.....	.42	.44	.47
" 24.....	.42	.46	.49
" 25.....	.43	.47	.50
" 26.....	.43	.50	.55
" 27.....	.44	.53	.58
" 28.....	.44	.53	.60
" 29.....	.45	.55	.65
" 30.....	.46	.60	.73

Note.—Lots of less than 50 lbs 5¢ ₱ lb extra.

Antimony—

Cookson.....₱ lb, 8½¢
Hallett's.....₱ lb, 8@8¼¢
Japanese.....₱ lb, 7½@7¾¢

Brass—Planished.....net

Roll and Sheet.....30% off

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List Feb. 26, 1896.

Plain Round Tube.	Per lb.	
¾-in. up to 2-in.	$0.35	30% off.
5/8-in. up to ¾-in.	.35	
½-in. up to 5/8-in.	.38	
3/8-in. up to ½ in.	.41	
5-16-in. up to 3/8-in.	.48	
¼-in. up to 5-16-in.	.65	
3-10-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3-in. and larger	Special	
2-in. to 3-in., to No. 19, inclusive.	.38	

Copper & Bronze Tubing—

3¢ ₱ lb more than Brass.

Conductors—

Corrugated. *Round or Square.*—

Galvanized, Nested.....80%
" Not Nested.....80%
" Locked Joints, Nested.....80%
" " Not Nested...80%
Tin.....70%

Spiral Riveted.

Galvanized.....50%
See also *Elbows and Shoes; Eave Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ₱ lb 20¢ base
Ingot.
Lake.....13¼¢
Ansonia Grade Casting.....12½¢
Planished.....net
Sheet and Bolt.....16¢ ₱ lb basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

List Feb. 1, 1895.
Lap or Slip Joint, Galvanized....80&10%
Lap or Slip Joint, Terne.....65%

Eave Trough Mitres—

Lap or Slip Joint.....list, 25%

Elbows—Plain Adjustable—

Tin.....70&10%
Galvanized.....80%

Crimped Tubing.

Retinned or Galvanized.....35%

Stove Pipe--

Buffalo Four-Piece.

	4½	5	5½	6	7-inch.
No. 1.	$0.70	.77	.82	.87	1.05 per doz.
No. 2.	.61	.66	.71	.74	....

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated. *Flat Crimp.*

Galvanized.....70&5%
Round or Square.
Tin.....70&5%
Galvanized.....70&5%

Gasoline—See *Petroleum Products.*

Iron, Sheet—*Black.*

	Common American.	R. G. Cleaned American.
Nos. 10 to 16.....	₱ lb, 2 00....	2.25¢
Nos. 17 to 21.....	₱ lb, 2.10....	2.35¢
Nos. 22 to 24.....	₱ lb, 2.20....	2 45¢
Nos. 25 and 26...	₱ lb, 2.30....	2.55¢
No. 27.....	₱ lb, 2.40....	2.65¢
No. 28.....	₱ lb, 2.50....	2 75¢
American B. B.....	₱ lb, 4¢	

Russia, Planished, &c.
Genuine Russia, according to assortment.....₱ lb, 10¼@10½¢
Do. Stained.....6¢@10¢
Patent Planished ₱ lb, A, 9¾¢; B, 8¾¢ net
Craig Polished Sheet Steel.....₱ lb 8½¢

Galvanized.

Nos. 10 to 16.....	₱ lb, 12¢	80% off.
Nos. 17 to 21.....	₱ lb, 13¢	
Nos. 22 to 24.....	₱ lb, 14¢	
Nos. 25 to 26.....	₱ lb, 15¢	
No. 27.....	₱ lb, 16¢	
No. 28.....	₱ lb, 17¢	
No. 29.....	₱ lb, 19¢	
No. 30.....	₱ lb, 21¢	

36 in. 1¢ ₱ lb higher

Kerosene—See *Petroleum Products*

Lead—

American Pig.....4⅛@4¼¢
Bar.....5¢
Pipe.....5½¢. 20%
Tin Lined Pipe.....12½¢. 20%
Block Tin Pipe.....30¢. 20%
Sheet.....6½¢. 20%
Old Lead in exchange, 3¼¢ ₱ lb.

Mitres, Eave Trough—See *Eave Trough Mitres.*

Nickel—

Per lb.....38¢

Paints, Oils, &c.—

Lead, White, Atlantic and Jewett's, 100@500 lb..... 6 ¢
Lead, Amn. White, in oil..... 6 ¢
Lead, Red bbls. and ⅛ bbls..... 6 ¢
Lead, Red, kegs..... 6 ¢
Ochre, American..... 1½¢
Red Venetian, American..... 1¾¢
Linseed Oil:
Raw, ₱ gal.....43@44¢
Boiled.....45@46¢
Spirits Turpentine:
In bbls.....85¢
In cases.....43¢
Putty:
In barrels and ½ bbls.....1¾@2¢
In tubs.....1¾@2¢
In tin cans.....2½@3¢
In bladders.....2@2½¢

Palm Oil. 1500 lb casks.

Fancy Lagos.....₱ lb 5¼¢
Clarified.....₱ lb 5 ¢
Accra.....₱ lb 4¾¢
Half Jack.....₱ lb 4½¢
Cecilia.....₱ 100 lb $4.85
Choice Red.....₱ 100 lb 4.60
(Spot Oil, ⅛c. ₱ lb higher.)

Petroleum Products—

In Barrels (Barrel included).

Stove Gasoline.....₱ gal. 10@11¢
Kerosene.....₱ gal. 8¢

Pipe, Drain.....50%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Plumbers' and Steam Fitters' Supplies—

List of June 1, 1896

Fittings—

Cast Iron Fittings, Black and Galvanized, Standard sizes.....75%
Cast Iron Fittings, Bushings and Plugs.....75%
Cast Iron Fittings, Flanges.....75%
Malleable Iron Bushings.....75%
" " Unions.....70%
" " American Unions.....40%
Wrought " Nipples.....75%
" " Couplings.....70%
" " Long Screws.....70%
Malleable " Fittings.....50%

Valves, Cocks, &c.—

Iron Body Valves.....75%
All Iron Valves.....70%
Air Cocks and Radiator Air Cocks 70@10%
Soldering Unions.....70%
" Nipples.....70@75%
Brass Unions (Union Joints).....70%
Vacuum Valves.....40%
Steam Swing Joints.....50%
Iron Strainers.....65%
Jenkins' Iron Body Valves, except Gate Valves.....65%
Jenkins' All Iron Valves, except Gate Valves.....60%
Jenkins' Iron Body Gate Valves.....60%
" All Iron Gate Valves.....60%
Iron Cocks, all Iron.....70%
" " with Brass Plugs.....60%
Brass Globe, Angle and Cross Valves. 70%
" " and Angle Valves, hose outlet.....70%
Brass Garden Hose Valves.....70%
" Horizontal, Vertical and Angle Check Valves.....75%
Brass Safety Valves.....70%
" " " Low Pressure....70%
" Radiator Valves.....70%
" " " Jenkins'.....65%
" Jenkins' Globe, Angle, Cross, Corner, Safety and Check Valves...65%
Brass Jenkins' Gate Valves.....60%
" Steam Cocks.....75%
" Gas Meter and Union Meter Cocks.....70%
Brass Fittings, Rough.....70%
" " Finished.....65%
" Bushings.....65%

Plumbers' Brass Work—

List of December 7, 1896.

Ground Key Work, Rough.....70%
" " " " Farnan's..65%
" " " " Finished..65%
Compression Work.....65%
Chain Stays.....60%
Iron Boiler Couplings, Ground Face, per set, $1.00.....net
Basin Plugs.....65%
Sink or Bath and Wash Tray Plugs..65%
Basin-Clamps.....60%
" " Plumbers' Joy, 50¢ ₱ doz.....net

Bath Tubs—

Copper Lined Bath Tubs.....50&10%
Steel Clad Copper Lined Bath Tubs, list of Oct. 20, 1897.....50%
Porcelain Lined Iron Bath Tubs, list of Aug. 15, 1896.....40%
Steel Clad Enamel Bath Tubs, list of Oct. 20, 1897.....50%

Boilers—

Galvanized Iron Range Boilers to and including 52 gallons.....75%
Galvanized Iron Range Boilers above 52 gallon.....60%
Galvanized Iron Range Boilers, Extra Heavy, to and including 52 gal..65&5%
Galvanized Iron Range Boilers, Extra Heavy, above 52 gallon.....50&5%

Cast Iron Goods.

Cast Iron Soil Pipe, Standard.....70%
" " " " Extra Heavy.....75%
" " " " Fittings.....75%
" " Sinks, Plain.....60%
" " " Galvanized.....60%
" " " Backs Plain.....60%
" " " " Galvanized....60%
" " " Legs Plain.....60%
" " " " Galvanized....60%
" " " Backs with air chambers, Plain.....60%
Cast Iron Sinks, Backs with air chambers Galvanized.....60%

Miscellaneous.

Earthenware, List of Dec 5, 1895....60%
Drawn Lead Traps, List of Aug. 2, 1897.....50%
Palmer's Improved Horizontal Back Water Sewer Valves.....35%
Climax Soil Pipe Testing Plugs.....50%

Registers—

List Dec. 20, 1897.

Black Japanned.....40&10%
White Japanned.....30&10%
Nickel Plated.....40& 0%
Bronze Finishes in Imitation of Gold, Silver, Copper or Bronze.....40%
Electroplated in Brass, Bronze or Copper.....40%

Rock and Slag Wool—

	₱ lb	₱ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Roofing Material—

Asphaltum, Trinidad Refined, ₱ ton.....$30.00@$35.00
Asphaltum, Rock, ₱ ton.....$14.00
Coal Tar Felt, 1 ply, ₱ lb.....2¢
2 Ply Roofing, ₱ roll, 108 sq. ft.....$1.00
3 Ply Roofing, ₱ roll, 108 sq. ft.....1.35
Roofing Pitch, ₱ bbl.....$2.40@$2.50

Rosin—

Common and Good—Strained.

Rosin, C. & D.....	₱ bbl.	$1.48@$1.49
Rosin, E & F.....	₱ bbl.	1.55@ 1.60
Rosin, G. & H.....	₱ bbl.	1.70@ 1.80
Rosin, I. & K.....	₱ bbl.	1.85@ 1.90
Rosin, M. & N.....	₱ bbl.	2.10@ 2.20

Seamless Brass Tubes—

Net List, Feb. 1. 1897.

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f. o. b. cars, Quarry Station.
Pennsylvania:

Best Bangor, ₱ sqr.	$3.50@$4.50
No. 1 Bangor Ribbon.....	3.00@ 3.25
Pen Argyle, ₱ sqr.....	3.25@ 3.50
Peach Bottom, ₱ sqr.....	4.75@ 5.60
No. 1 Chapman, ₱ sqr....	3.00@ 4.25
Lehigh Slates, ₱ sqr	3.25@ 3.80

Vermont:

Sea Green, ₱ sqr.....	$2.45@$3.05
Purple, ₱ sqr.....	3.75@ 4.00
Variegated Purple.....	2.25@ 2.90
Unfading Green, ₱ sqr...	3.50@ 4.00
Red, ₱ sqr.....	8.50@10.50

Solder and Soldering Fluids—

Solder—

½&½ guaranteed..... 10¾@11¢
No. 1..... 9¾@10¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Acme Soldering Flux.
Per gal.....60¢
Concentrated Soldering Flux.
f. o. b. New York.
In barrels. ₱ lb.....4¢
Smaller quantities, ₱ lb.....5¢
Gedney's Soldering Fluid.
In carboys or barrels, ₱ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.
Perfection Soldering Flux.
No charge for package.
Bbls. about 500 lb, ₱ lb.....3½¢
½ bbls. about 300 lb, ₱ lb.....4¢
Kegs, about 110 lb, ₱ lb.....4¢
75¢ extra for keg. (5% dis.)
Kegs about 55 lb. ₱ lb.....4¢

Yager's Soldering Salts.
½ lb bottles, each.....30¢
Large quantities, ₱ lb.....40¢

Soldering Coppers—

Per lb.....16¢@17¢ net

Spelter—

Western Spelter.....4.65@4¾¢
Bertha (pure).....7@7½¢

Spiral Pipe—See *Pipe, Spiral.*

Stove Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers, Conductor—

Galvanized.....60%

Tin Pigs and Bars—

Banca, Pigs, ₱ lb.....15½¢
Straits, pigs, lb lb.....15@15¼¢
Straits, in bars, ₱ lb.....16¢

Tin Plates, American—

Charcoal Plates, Bright—

N. B.—The price of 20 x 28 sizes is double the price of 14 x 20.

Calland or Melyn Grade,	IC,	10 x 14 / 14 x 20	$4.75
" "	IX,	10 x 14 / 14 x 20	5.75
" "	IXX,	14 x 20	6.75
" "	IXXX,	14 x 20	7.75
" "	IXXXX,	14 x 20	8.75
" "	DC,	12½ x 17	4.25
" "	DX,	12½ x 17	5.25
Allaway Grade,	IC,	10 x 14 / 14 x 20	4.25
" "	IX,	10 x 14 / 14 x 20	5.40
" "	IXX,	14 x 20	5.75
" "	IXXX,	14 x 20	6.50
" "	IXXXX,	14 x 20	7.25

Coke Plates, Bright—

Bessemer Steel, or equal to J. B. Grade, full weight	IC,	10 x 14 / 14 x 20	$3.50 @ 3.60
" "	IX,	10 x 14 / 14 x 20	4.35 @ 4.45

N. B.—The reduction per box on lighter Plates than IC, 14 x 20, is as follows:

100 lb	10¢
95 lb	15¢
90 lb	20¢
85 lb	25¢

Terne Plates—

N. B.—The following prices are for IC, 20 x 28, the rate for 14 x 20 being half as much. IX is usually held at $2 per box advance:

Standard Old Style, 36 to 40 lb coating...	$11.50 @ 13.00
Redipped, or Good Old Style, 20 to 30 lb coating.....	10.00 @ 11.00
Worcester Grade, 12 to 14 lb coating.....	8.00 @ 9.25
STP / L Grade, 10 to 12 lb coating.....	6.75 @ 7.50

Boiler Plates, American—

IXX, 14 x 26..(112 sheets).....	$9.10
IXX, 14 x 28..(112 sheets).....	9.80
IXX, 14 x 31..(112 sheets).....	10.85

Tin Plates, Imported—

Duty, 1½¢ ₱ lb.

Charcoal Plates, Bright—

Melyn and Calland Grade,	IC,	14 x 20	$5.00
" "	IX,	14 x 20	6.00
Allaway Grade,	IC,	14 x 20	4.25
" "	IX,	14 x 20	5.00

Coke Plates, Bright—

Steel Coke,	IC, 14 x 20	$4.25
	IX, 14 x 20	5.25

Terne Plates—

Worcester Grade,	IC, 14 x 20	4.25
	20 x 28	8.50
Dean Grade,	IC, 14 x 20	4.00
	20 x 28	8.00
Gilbertson's Old Method,	IC, 14 x 20	7.50
	20 x 28	15.00

Troughs, Eave—See *Eave Trough*

Trucks, Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved pattern, ₱ doz... 18.00

Tubing—

Tin.....55% | Galvanized.....55%

Wrought Iron Pipe—

List Feb. 1, 189 .

1¼ and less, Plain....	67&10&10&10&10%
1¼ and less, Galv.	50&10&10&10&10%
1½ and larger, Plain	67&10&10&10&10%
1½ and larger, Galv	55&10&10&10&10%
Screw and Socket Joint Casing.....	65%
Inserted Joint Casing.....	60%
Boiler Tubes, 2¼ inch and smaller.	72½%
" 2½ inch and larger	75%

Zinc—

600 lb casks ₱ lb 5¾¢ | Per lb..... 6¼¢

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I. X. L. Beer Pump Co., Phila., Pa.

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White Mfg. Co., Syracuse, N. Y.

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Canton Steel Roofing Co., Canton, O.
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Frand, Martin J. & Co., Camden, N. J.
Friedley & Voshardt, Chicago, Ill.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
Northrop, H. S., 40 Cherry St., N. Y.
Souther, E. E. Iron Co., St. Louis, Mo.

Cellar Drainers.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Clean Out.
Crawford & Young, Boston, Mass.

Cocks, Ball, Basin and Stop.
Landers, Frary & Clark, New Britain, Conn.
Peck, Bros. & Co., New Haven, Conn.
Stebbins, E. Mfg. Co., Brightwood, Mass.

Coffee Pots.
Rochester Stamping Works, Rochester, N. Y.

Coils.
National Pipe Bending Co., New Haven, Conn.

Conductor Pipe and Elbows.
Berger Bros. Co., Philadelphia, Pa.
Bowers, L. M. & Co., Binghamton, N.Y.
Buffalo Corrugating Co., Buffalo, N. Y.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Lawreuce-Letts Elbow Co., Ltd., Waverly, N. Y.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh Pa.
Marlin & Co., Pittsburgh, Pa.

Cooking Utensils.
Hill, Whitney & Wood Co., Boston, Mass.

Conductor Pipe Machinery.
Poorman Mfg. Co., Piqua, O.

Copper, Roofing and Cornice.
Gummey, McFarland & Co., Phila., Pa.
Hussey, C. G. & Co., Pittsburgh, Pa.

Copper Bottoms.
Hussey, C. G. & Co., Pittsburgh, Pa.

Cork Pullers.
Arcade Mfg. Co., Freeport, Ill.

Cornice Machinery.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.

Cornice Work, Galvanized Iron.
Garry Iron & Steel Roofing Co., Cleveland, O.
Marlin & Co., Pittsburgh, Pa.

Couplings. (*See Pipe Couplers.*)

Covering, Pipe and Boiler.
Johns H. W. Mfg. Co., 100 William St., N. Y.

Cuspidors.
Rochester Stamping Works, Rochester, N. Y.

Cut Offs. Rain Water.
Berger Mfg. Co., Canton, O.
Cooney, Seiner & Co., Indianapolis, Ind.
Smith, W. A. & Co., Lima, Ohio.

Dampers.
Arcade Mfg. Co., Freeport, Ill.
Berger Bros. Co., Phila., Pa.
Greene, W. F., Troy, N. Y.
Griswold Mfg. Co., Erie, Pa.
Troy Nickel Works, Troy, N. Y.

Die Stocks.
Crawford & Young, Boston, Mass.
Curtis & Curtis, Bridgeport, Ct.

Drop Hammers.
Bliss, E. W. Co., Brooklyn, N. Y.

Dumb Waiters.
Energy Mfg. Co., Phila., Pa.

Eave Troughs.
Berger Bros. Co., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, L. M. & Co., Binghamton, N. Y.
Buffalo Corrugating Co., Buffalo, N. Y.
Eller, J. H. & Co., Canton, O.
Lyon, Conklin & Co., Baltimore, Md.
Marlin & Co., Pittsburgh, Pa.
Souther, E. E. Iron Co., St. Louis, Mo.

Eave Trough Hangers.
Baker, J. R. & Sons Co., Kendallville, Ind.
Berger Mfg. Co., Canton, O.
Chautauqua Hanger Co., Mayville, N. Y.

Eave Trough Machines.
Marlin & Co., Pittsburgh, Pa.

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Lawrence-Letts Elbow Co., Ltd., Waverly, N. Y.

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Eddy Electric Mfg. Co., Windsor, Coun.
Hanson & VanWinkle Co., Newark, N.J.
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Eddy Electric Mfg. Co., Windsor, Coun.

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Eddy Electric Mfg. Co., Windsor, Conn.

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Lalance & Grosjean Mfg. Co., 19 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

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Koven, L. O. & Bro., 18 Spruce St., N. Y.

Farmer's Boilers.
Wheeler, Russel & Son, Utica, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Fire Felt.
Johns, H. W. Mfg Co., 100 William St., N. Y.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Furnace Cement, Asbestos.
Connors, William, Troy, N. Y.

Furnace Pipe and Fittings.
Cartou Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.

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Barstow Stove Co., Providence, R. I.
Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Carton Furnace Co., Utica, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Excelsior Steel Furnace Co., Chicago, Ill.
Front Rank Steel Furnace Co., St. Louis, Mo.
Giblin & Co., Utica, N.Y.
Graff & Co., 208 Water St., N. Y.
Griffing, A. A. Iron Co., 66-68 Centre St., N. Y.
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Pease, J. F., F'ce Co., Syracuse, N. Y.
Richmond Stove Co., Norwich, Ct.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Furnace Co., 50 Cliff St., N.Y.
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White Mfg. Co., Syracuse, N. Y.

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Keen & Hagerty Mfg. Co., Baltimore, Md.
Shepard, Sidney & Co., Buffalo, N. Y.

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Cleveland Gas Machine Co., Cleveland, Ohio.
Kent, C. M. Mfg. Co., Baltimore, Md.

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Tucker & Koester, 543 East 116th St., N. Y.

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St. Louis Stamping Co., St. Louis, Mo.

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Jackson, W. Sons, 246 Front St., N. Y.

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Palmer, I. E., Middletown, Ct.

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Gorton & Lidgerwood Co., 95 Liberty St., New York.
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Vance Steam Boiler Works, Geneva, N. Y.
Wheeler, Russel & Son, Utica, N. Y.

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Kieckhefer Bros. Co., Milwaukee, Wis.
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Buffalo Corrugating Co., Buffalo, N. Y.
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Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Eller, J. H. & Co., Canton, O.
Garry Iron & Steel Roofing Co., Cleveland, O.
Gummey, McFarland & Co., Phila., Pa.
Holton Iron Roofing Co., Lisbon, O.
Kansas City Roofing & Cor. Co., Kansas City, Mo.
New York Iron Roofing & Cor. Co., Jersey City, N. J.
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Sykes Iron & Steel Roofing Co., Chicago, Ill.

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Burritt, O. W. & Bro., Weedsport, N.Y.
Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

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Bangor Excelsior Slate Co., Bangor, Pa.
Bray, J. & Co., E. Bangor, Pa.
Galt, John & Sons, 253 Broadway, N.Y.
Johnson, E. J. & Co., 38 Park Row, N.Y.

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Ferrosteel Co., Cleveland, O.

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Bertsch & Co., Cambridge City, Ind.
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Clough, R. M., Tolland, Conn.
Double Truss Cornice Brake Co., Buffalo, N. Y.
Keene, Geo. O. & Co., Cincinnati, O.

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Miner & Peck Mfg. Co., New Haven, Conn.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Pocock, O., Cincinnati, O.
Poorman Mfg. Co., Piqua, Ohio.
Robinson, J. M. & Co., Cincinnati, O.
Stiles, E. S. Press Co., Watertown, N.Y.
Stiles & Parker Press Co. Brooklyn, N. Y.
Toledo Mach. & Tool Co., Toledo, O.
West Mfg. Co., Buffalo, N. Y.
Whelan, Dennis J., Troy, N. Y.

Sheet Metal Work.

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Apollo Iron & Steel Co., Pittsburgh, Pa.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McCullough Iron Co., Wilmington, Del.
Morton Tin Plate Co., Cambridge, O.
Osborn, J. M. & L. A., Cleveland, O.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Sheets, Galvanized.

Ætna-Standard Iron & Steel Co., Bridgeport, O.
Apollo Iron & Steel Co., Pittsburgh, Pa.
Bruce & Cook, 186 to 190 Water St., N. Y.
Cinn Corrugating Co., Piqua, Ohio.
McClure & Co., Pittsburgh, Pa.
McCullough Iron Co., Wilmington, Del.
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McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
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Williams Stove Lining Co., Taunton, Mass.

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Gobeille Pattern Co., Cleveland, O.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Berger Bros. Co., Phila., Pa.

Stove Pipe Collars.

Paxton Hdw. Co., Paxton, Ill.

Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

Stove Polishing Mitten.

Parks & Parks, Troy, N. Y.

Stove Putty.

Connors, Wm., Troy, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
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Troy Nickel Works, Troy, N. Y.

Stove Trimmings, &c.

Arcade Mfg. Co., Freeport, Ill.
Greene, W. F., Troy, N. Y.
Troy Nickel Works, Troy, N. Y.

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Bergstrom Bros. & Co., Neenah, Wis.
Bibb, B. C. Stove Co., Baltimore, Md.
Brand Stove Co., Milwaukee, Wis.
Graff & Co., 208 Water St., N. Y.
Hess, Snyder & Co., Massillon, O.
Magee Furnace Co., Boston, Mass
Portsmouth Stove & Range Co., Portsmouth, O.
Richmond Stove Co., Norwich, Ct.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.
Sheppard, Isaac A. & Co., Phila., Pa.
Van, John, Range Co., Cincinnati, O.
Weir Stove Co., Taunton, Mass.
White-Warner Co., Tauntou, Mass.

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Griswold Mfg. Co., Erie, Pa.
Ringen Stove Co., St. Louis, Mo.

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Cleveland Foundry Co., Cleveland, O.
Monarch Stove & Mfg. Co., Mansfield, Ohio.
Ringen Stove Co., St. Louis, Mo.
Schneider & Trenkamp Co., Cleveland, Ohio.

Tea Kettles.

Hill-Whitney & Wood Co., Boston, Mass.
Rochester Stamping Wks., Rochester, N. Y.

Tea Pots.

Rochester Stamping Works, Rochester, N. Y.

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Berger Bros. Co., Phila., Pa
Bertsch & Co., Cambridge City, Ind.
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Bruce & Cook, 186 to 190 Water St., New York.
Follansbee Bros. Co., Pittsburgh, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Lindas, H., Edgerton, Wis.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Murray St., New York.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 26 Cliff St., N. Y.
West Mfg. Co., Buffalo, N. Y.

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Bruce & Cook, 186 to 190 Water St., New York.
Coe, Jas. A. & Co., Newark, N. J.
Ellwood Tin Plate Co., Ellwood City, Pa.
Follansbee Bros. Co., Pittsburgh, Pa.
Gummey, McFarland & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Morton Tin Plate Co., Cambridge, Ohio.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.

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Meurer Bros. Co., Brooklyn, N. Y.
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Peck Bros. & Co., New Haven, Conn.

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Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

HELP WANTED.

A good TINSMITH, acquainted with all branches of the trade; a steady job the year round. F. L. Frick, Manhasset, L. I., N. Y. March 26

Two PLUMBERS and GAS FITTERS: must be up to date in sanitary work; state wages and experience; nine hours' work; not less than ten years' experience required; soberness and with push. Guarantee Heating & Plumbing Company, Hightstown, N. J. March 26

At once, man who thoroughly understands STAMPED TINWARE in all branches. "Con," office of *The Metal Worker*, 232-238 William street, New York City. March 26

A good FURNACE FOREMAN who can manage men; must be well recommended. The Bailey Heating Company, 522 Stevenson Building, Indianapolis, Ind. March 26

Boss PATTERN FITTER; only those thoroughly familiar with fine stove work need apply "A. B.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. March 26

A CUTTER and RAISER in cornice shop; man capable of taking charge. "H. A. R.," office of *The Metal Worker*, 117-119 South Fourth street, Philadelphia, Pa. March 26

At once, a first-class PLUMBER, STEAM and HOT WATER FITTER; man who can do tinsmithing preferred; must be temperate and reliable; no other need apply; $2.50 per day and steady work for the right man. W. H. Stoyle, Huntington, N. Y. March 26

SHIPPER of experience by a plumbing supply house; state age, experience and salary. "Shipper," office of *The Metal Worker*, 232-238 William street, New York City. March 26

SALESMAN visiting the hardware, stove and furniture trade, having a little extra time, can get a good side line with good commission. The Reliable Polish Company, Hooper, Neb March 26

A large manufacturing concern wants a SUPERINTENDENT who is experienced in hardware lines, stamped ware, machinery and foundry; must have executive ability, be able to inaugurate a sharp system of costs and handling; only parties who have held similar positions need apply. Address, stating age, experience, articles you have been manufacturing and salary wanted, "Manufacture," office of *The Metal Worker*, 232-238 William street, New York City. March 26

A good TINNER; one who has a good knowledge of plumbing preferred. Lock Box 36, Willoughby, Ohio. March 19

Thoroughly competent SUPERINTENDENT for factory making plain lacquered and lithographed tin boxes and packages; must be a good executive; liberal salary and interest in the profits to the right man. Address stating age, experience and reference; all communications will be treated strictly confidential. "Tin Boxes," office of *The Metal Worker*, 232-238 William street, New York City. March 19

First-class PLUMBER for best town in Florida; must be able to estimate. Apply, giving all partiulars, to "Florida," office of *The Metal Worker*, 232-238 William street, New York City. March 19

A first-class experienced stove SALESMAN to sell a leading trade-mark line in Illinois; address in confidence with full particulars as to past experience, sales, salary, age, &c., "First-Class," office of *The Metal Worker*, 232-238 William street, New York City. March 19

A young man to take charge of shop where lithographed tin boxes are made up. P. O. Box 348, Montreal, Quebec, Canada. March 19

A good all around TIN and SHEET IRON WORKER; must understand iron piping and have some knowledge of plumbing; be able to clerk in hardware store; be sober and reliable; a steady job for the right man; state age and wages expected. "Hardware," Box 12, Luzerne, N. Y. March 19

SITUATIONS WANTED.

Steady position by a PATTERN FILER and MENDER. "Steady," office of *The Metal Worker*, 232-238 William street, New York City. March 26

By a first-class PLUMBER; can do furnace, roofing and general jobbing; first-class references; can estimate on all kinds of work pertaining to the trade. J. Rober, 4 Rollins street, Boston, Mass. March 26

TRAVELING SALESMAN, 15 years' experience selling hardware and tinware in New York State, Pennsylvania and Ohio, having an extensive acquaintance and commanding a large trade, would like a position with a jobber or manufacturer; good address, strong personality, energetic, aggressive; exceptional ability; highest references. "Energy," office of *The Metal Worker*, 232-238 William street, New York City. March 26

A first-class PLUMBER, STEAM and HOT WATER FITTER would like to get work where he could learn the tinsmith trade; will work for low wages; would prefer Illinois or west of Mississippi River. J. J. Tanner, Chicago, General Delivery. March 26

By a young man as TINNER; understands flat and standing seam roofing thoroughly, guttering, spouting, jobbing on stove, range and furnace work, cistern pumps and gas fitting; sober and steady. "J. F.," 117 Liberty street, Bloomfield, N. J. March 26

Steady position by a first-class TINSMITH; 16 years' experience at inside and outside work; understands furnace and pipe work; sober and reliable. P. O. Box 982, Herkimer, N. Y. March 26

A JAPANNER (plain and ornamental) as foreman; understands all of the branches and can furnish first-class references. Fred. J. Beck, 1801 Freeman avenue, Cincinnati, Ohio. March 26

By a first-class, experienced TINNER and SHEET METAL WORKER; understands all kinds of inside and outside work, roofing, heating, ventilating and general jobbing; some knowledge of plumbing and bicycle repairing; thoroughly familiar with the hardware trade and bookkeeping; strictly temperate and reliable; 29 years of age; married; permanent position preferred. "Tinsmith," 75 West Ninty-fifth street, New York City. March 26

By a young married man who is a first-class LEAD WORKER, SANITARY PLUMBER, GAS FITTER and JOBBER; has had experience at steam and hot water fitting; can do bar work of all kinds; can figure or estimate on all the above and can do clerical work. "G. A. Plumber," office of *The Metal Worker*, 232-238 William street, New York City. March 26

As CLERK, by young man; eight years' experience as clerk in retail hardware and stove store; can give best of references. "M.," office of *The Metal Worker*, 232-238 William street, New York City. March 26

By junior PLUMBER and GAS FITTER, with knowledge of outside tinning; sober, honest and industrious; well recommended; five years' experience; city or country. H. Vickerman, 52 Broad street, Pittsfield, Mass. March 26

First-class ENAMELER, with the very best of receipts for sheet iron, steel and cast iron, in colors, of the finest white, two blue, two brown, one gray, ivory, two reds, two blacks, in three coats, two very best receipts in gray and blue with one coat Martin Henkle, 39 South Fourth street, Brooklyn, N. Y. March 26

By a first-class PLUMBER, STEAM and HOT WATER FITTER of ten years' experience; also understands slate, tin and steel roofing; strictly temperate and steady. "Stan," Lock Box 23, Enfield, N. H. March 26

Permanent situation by a young man 23 years of age who understands bookkeeping thoroughly and is willing to work; will start on small salary if prospects of advancement; best of reference as to character and honesty. F. E Thorpe, Greenspring, Ohio. March 26

TRAVELING SALESMAN acquainted with stove, house furnishing and plumbing trade in San Francisco and vicinity wishes to represent Eastern manufacturers; full line or side lines; salary or commission; references given. "C. H.," 1217 Harrison street, Oakland, Cal. March 26

By a practical PLUMBER, GAS and STEAM FITTER in good live town of 10,000 or over; has all the tools and appliances to carry on the trade; references as to ability and sobriety. "J. A. B.," office of *The Metal Worker*, 232-238 William street, New York City. March 26

By a young man who has had 13 years' experience at plumbing, tinning and iron pipe work; five years' experience in New York City and eight in the country; a good general hand; steady position desired in a nice country town; will work for $1 per day and board. "J. B.," 21 Hudson street, New York City. March 26

As FOREMAN and CUTTER in a first-class roofing, cornice and skylight shop by an experienced mechanic; thoroughly understands the business in every detail; steady and sober; can come well recommmended. "Foreman," office of *The Metal Worker*, 232-238 William street, New York City. March 26

By a man with over 25 years' experience at plumbing, gas fitting, steam and hot water heating, a steady job; nine years with last employers; also understands tinsmith work. A. E. Wilcox, Cooperstown, N. Y. March 26

Steady job by a young man who can do tin work, plumbing and heating in all branches; good reference. I. W Secor, Box 107, Altamont, N. Y. March 26

By a first-class PLUMBER; city or country. P. Kelly, 194 Concord street, Brooklyn, N. Y. March 26

By a married man who has had 19 years' experience at tin, sheet iron and furnace work; can do a fair job of plumbing; wages $2 per day; steady work; would prefer New York State; first-class references. "Experienced," office of *The Metal Worker*, 232-238 William street, New York City. March 26

By a TINNER and SHEET IRON WORKER; understands iron piping and general jobbing. P. O. Box 476, Babylon, L. I., N. Y. March 26

Steady job by a TINSMITH; a first-class workman; 14 years' experience. "R. J.," Box 221, Lenox, Mass. March 26

As CLERK or BOOKKEEPER; age 35; a practical man in all departments of the hardware business; a good stock keeper; have kept book in a $45,000 business to the satisfaction of employers; with present firm over five years; understand and make estimates aud plans on all kinds of tin work, plumbing, hot air, hot water and steam heating; reference first-class; bond if required; strictly temperate; married; good reasons given for making a change. L C. Van Dyke, Ames, Iowa. March 26

By an up to date wrought steel RANGE MAKER; 16 years' experience at steel cooking apparatus; has all bench tools. "Wm. R. B.," 320 Fort street, W., Detroit, Mich. March 19

By a young man 28 years of age, who has had 14 years' experience at pipe fitting, steam, hot water and gas; good general haud at steam, hot air and water pumps and repairing. "H. E. S.," 66 Cliff street, New York City. March 19

As FOREMAN and CUTTER in a cornice and skylight shop, by a sober and industrious mechanic of 20 years' experience: competent in all branches. "J. H. B.," 122 Ralph street, Brooklyn, N. Y. March 19

TINSMITH, first-class workman, would like a steady job; experienced at roofing, spouting, stove, range and good furnace worker; also tinware, pump and commou plumbing; 18 years' experience, 34 years old, single, and steady habits; wages moderate. Chas. C. Stites, Port Jefferson, N. Y. March 19

By a young man, 21 years of age; city or country; three years' experience as PLUMBER and GAS FITTER; good reference. John C. Donohoe, 62 Linden avenue, Sing Sing, N. Y. March 19

TINSMITH, an all around mechanic; can do any work coming to a general job shop; steam, hot water and hot air; can make estimates; thoroughly sober and industrious; middle-aged, unmarried, excellent reference; will make reasonable arrangements for immediate engagement; country preferred. "Mechanic," care Chas. C. Proffett, 38 Bleecker street, New York City. March 19

As inside or outside CORNICE WORKER or as ASSISTANT CUTTER; good reference; state wages "C.," 328 East Chestnut street, Lancaster, Pa. March 19

As FOREMAN or CUTTER in a large cornice and skylight shop; I am thorough in all branches of the business; good draftsman; can estimate and handle men to best advantage; strictly sober. "Foreman," office of *The Metal Worker*, 22-24 Pickering Building, Cincinnati, Ohio. March 19

As TIN ROOFER and GENERAL JOBBER, by a young man 29 years of age, willing to work for $9 per week; country preferred. J. L. Watrous, Mills Hotel, Bleecker street, New York City. March 19

By a good steady CORNICE MAKER; can take charge of shop or outside work if required. "Cornice Maker," 132 South Green street, Chicago, Ill. March 19

By an all around TINSMITH at inside and outside work; furnace and iron pipe worker; 14 years' experience; first class reference. For particulars, P. O. Box 237, Marlboro, Ulster County, N. Y. March 19

By a PLUMBER, STEAM and GAS FITTER; a practical mechanic; first-class references; will board with employer. James Scanlan, 552 Ninth avenue, New York City. March 19

First-class PLUMBER, GAS FITTER and ROOFER; understands city and country work; new work and general jobbing; have reference and journeyman's license; city or country; wages $2. A. Yack, 718 Second avenue, New York City. March 19

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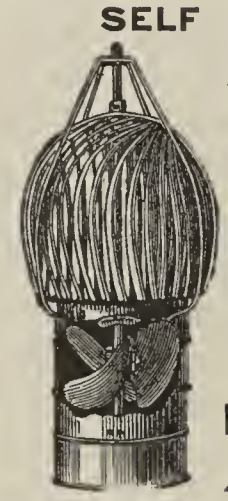
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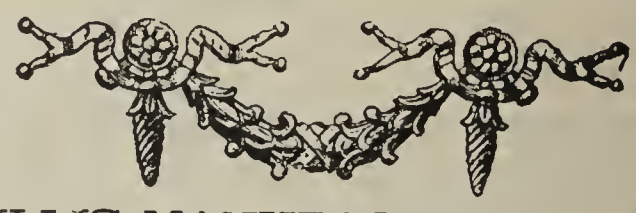
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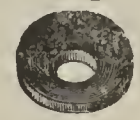


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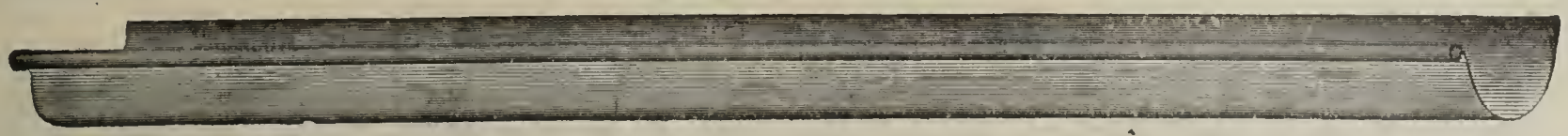
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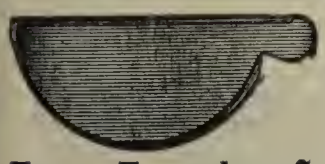
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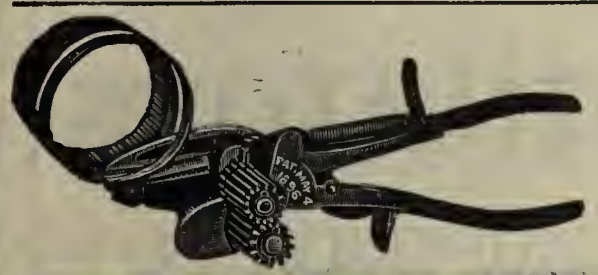
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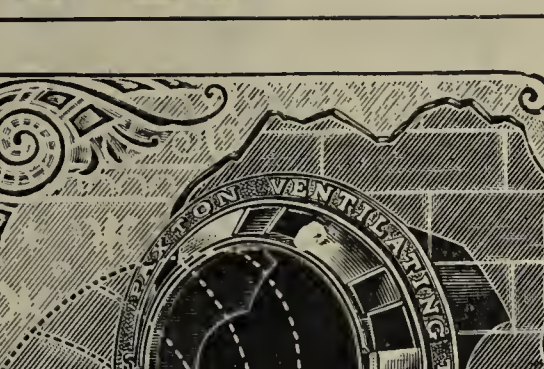
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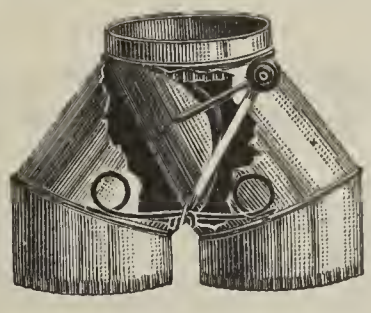
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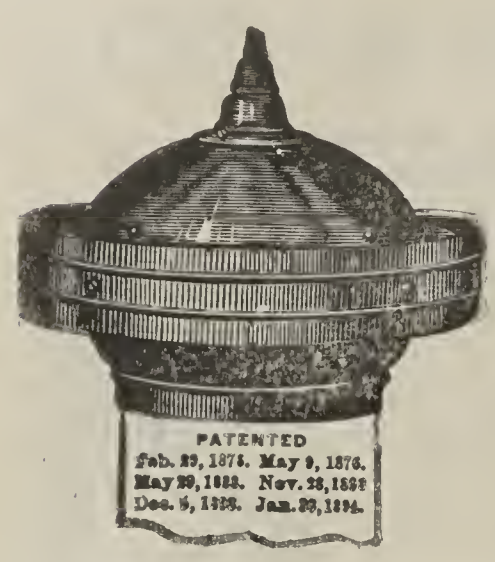
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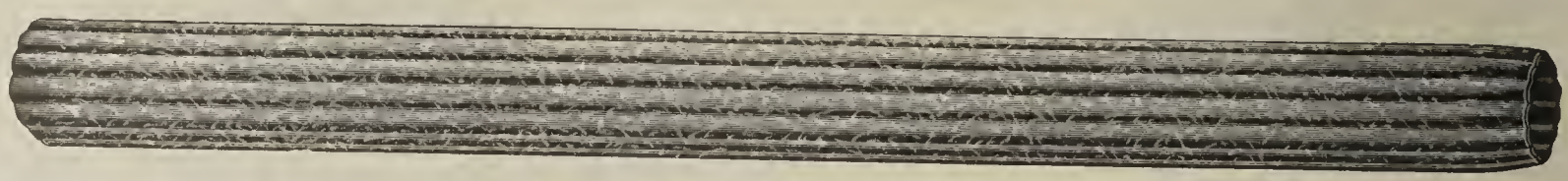
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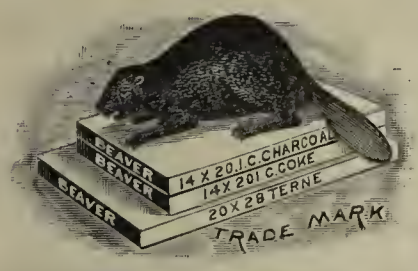
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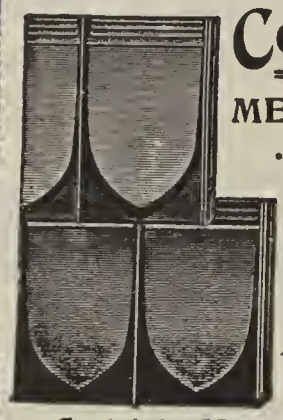
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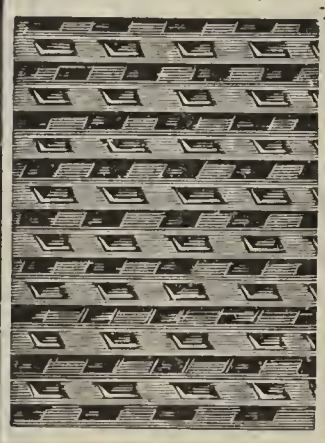
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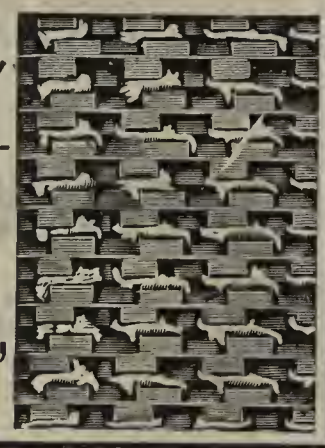
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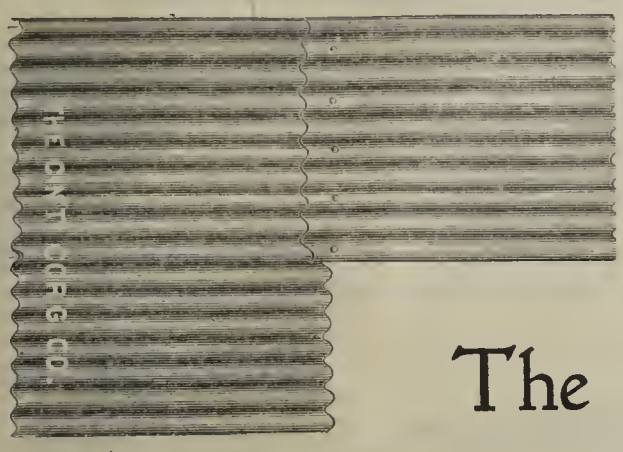


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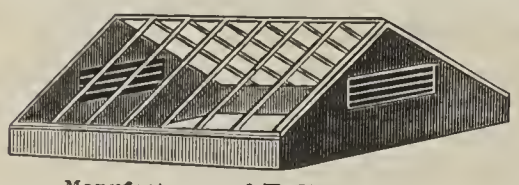
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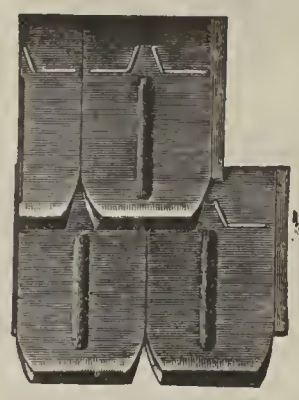
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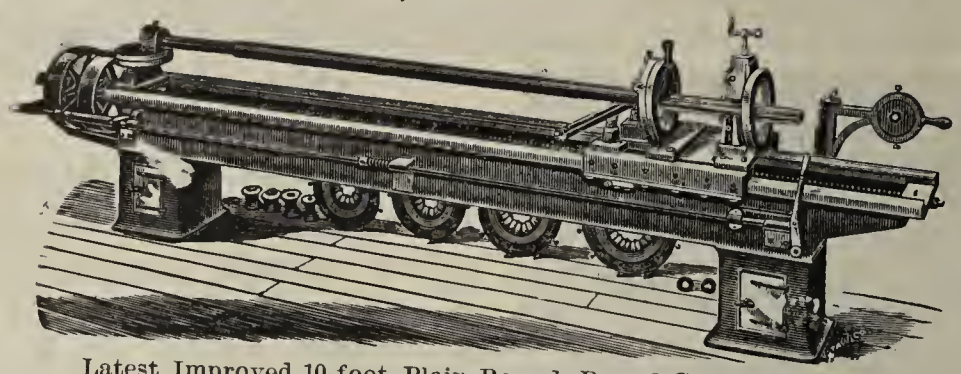
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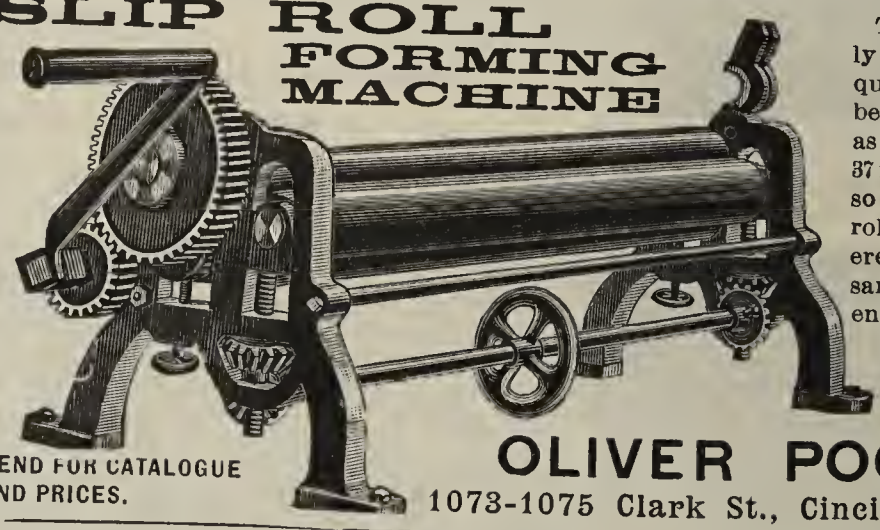
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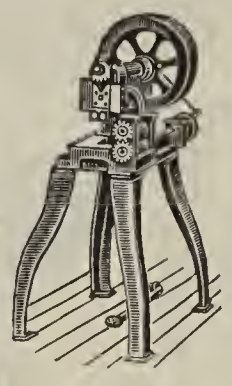
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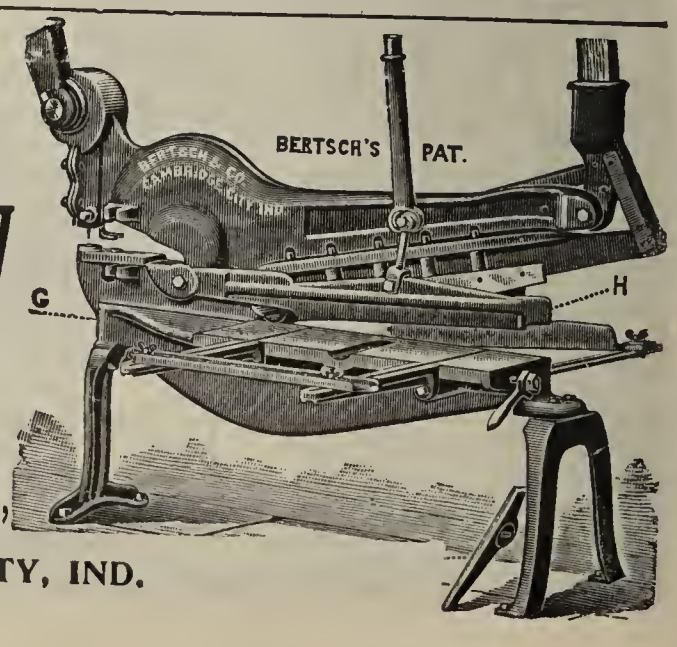
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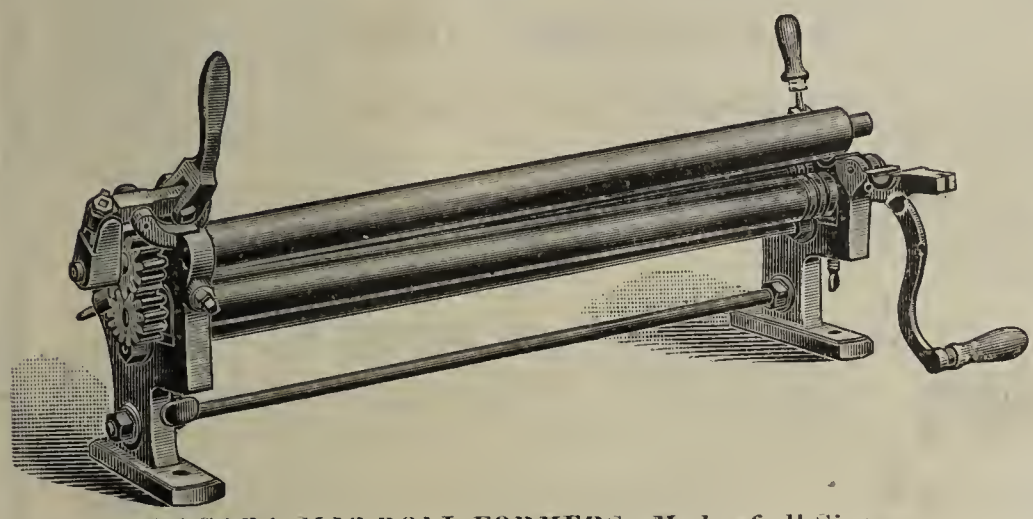
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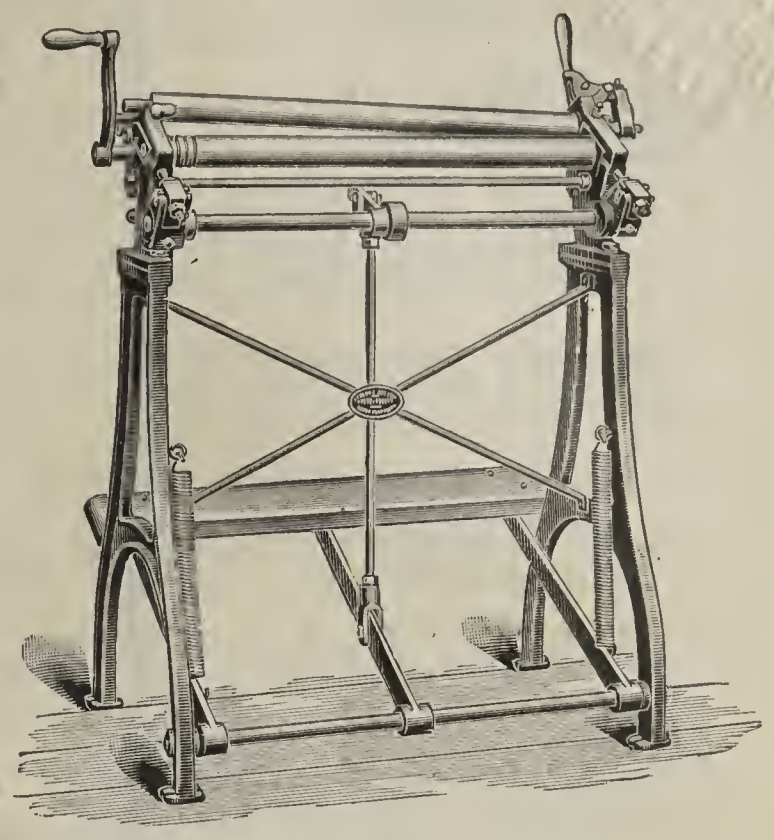
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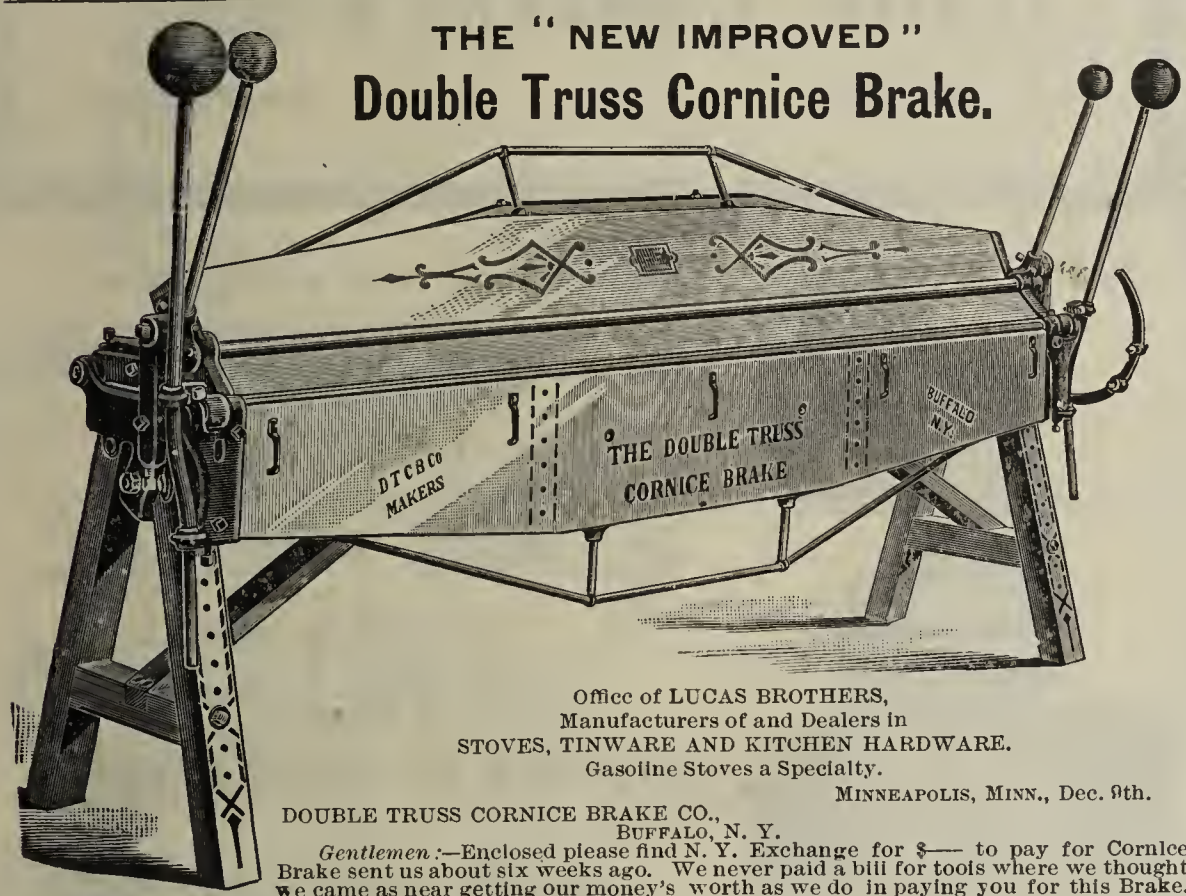


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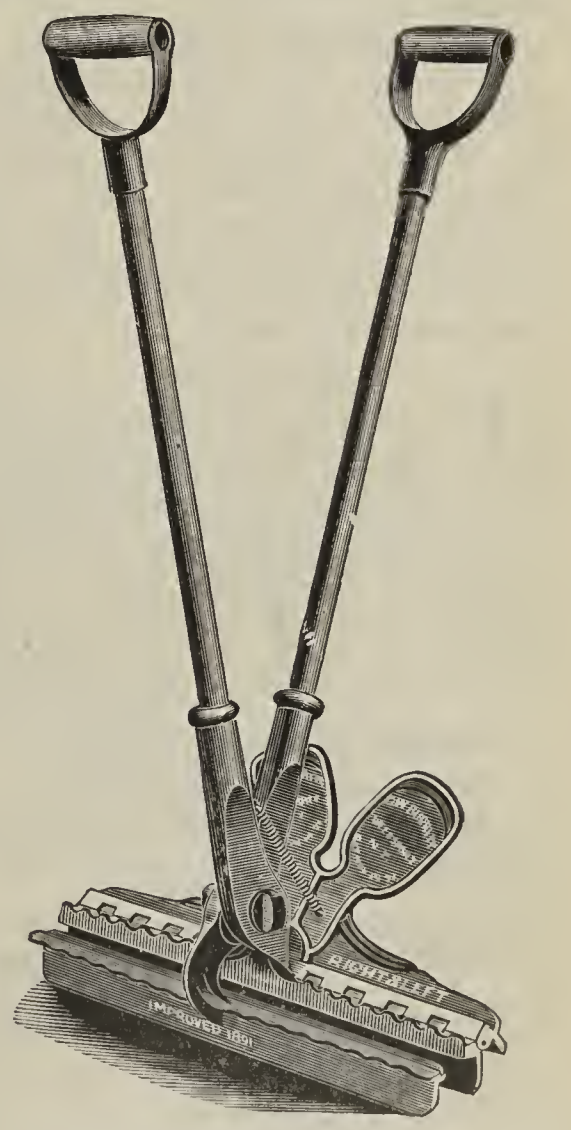
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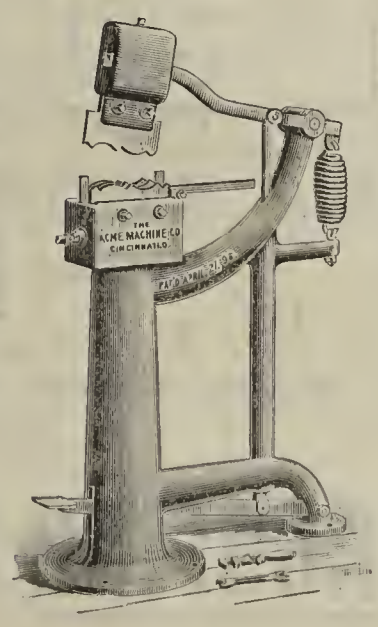
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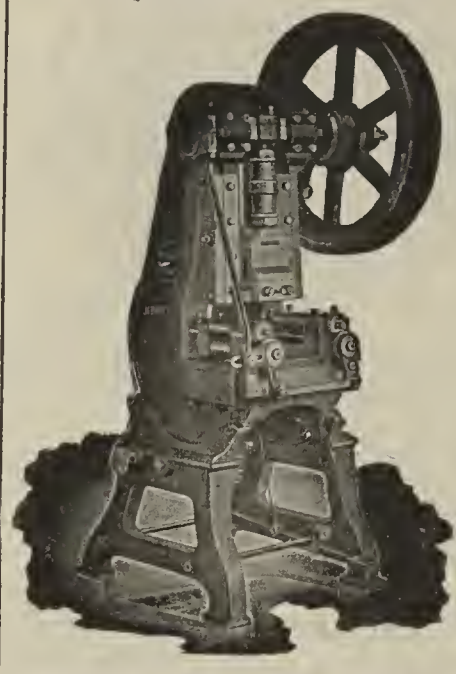
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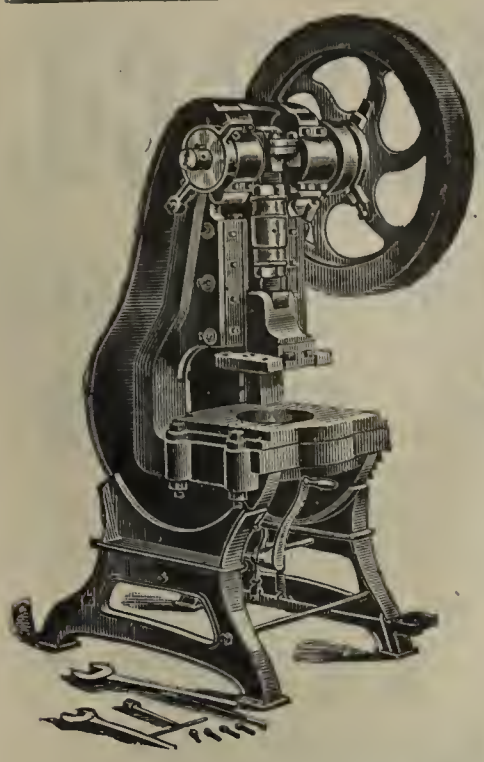
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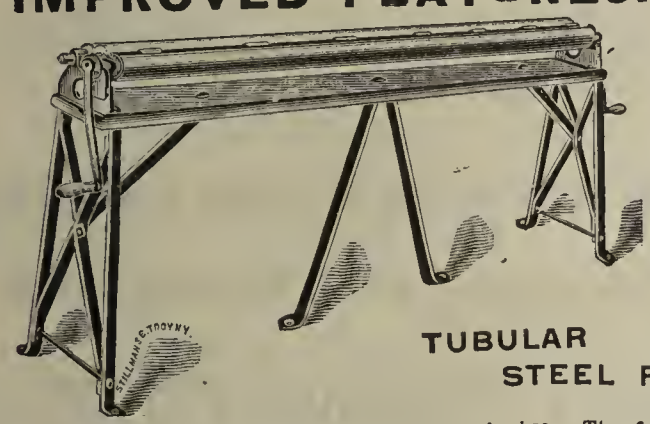
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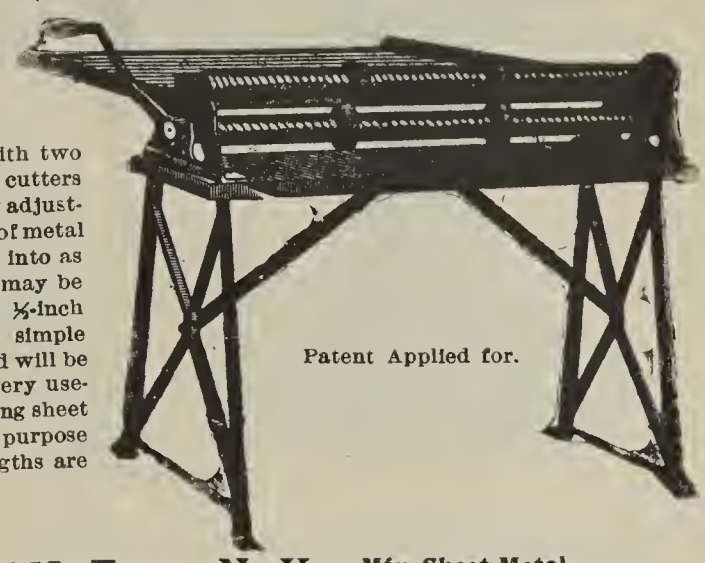
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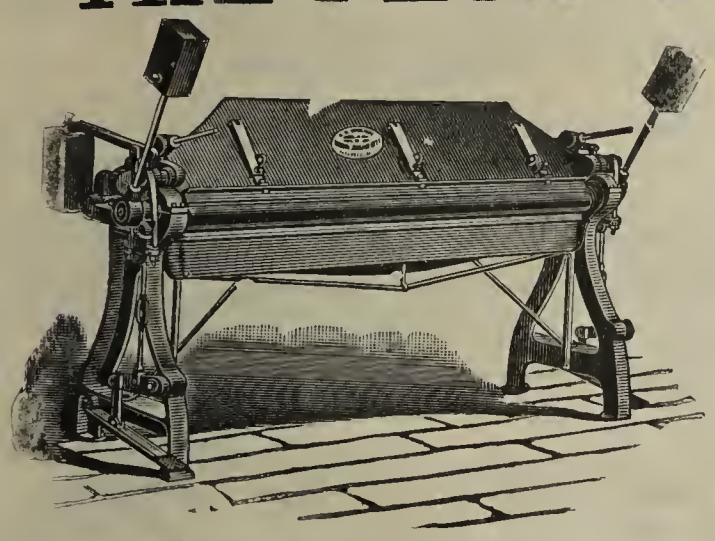
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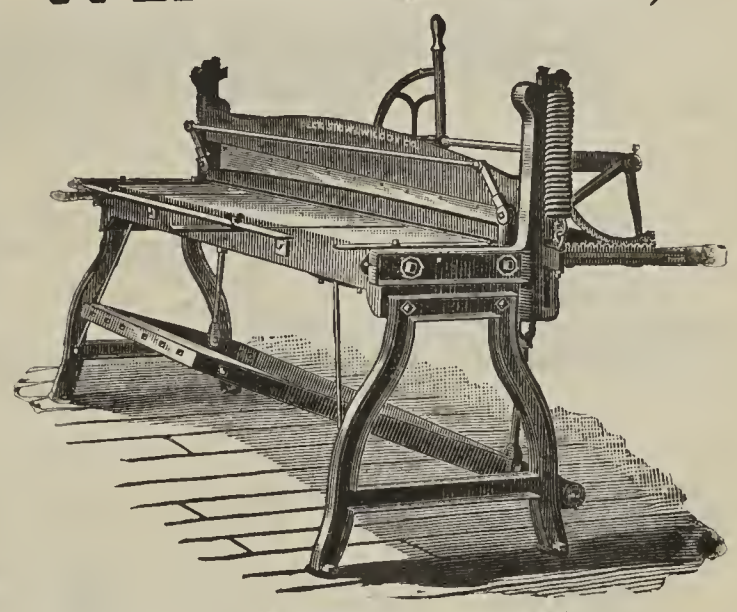
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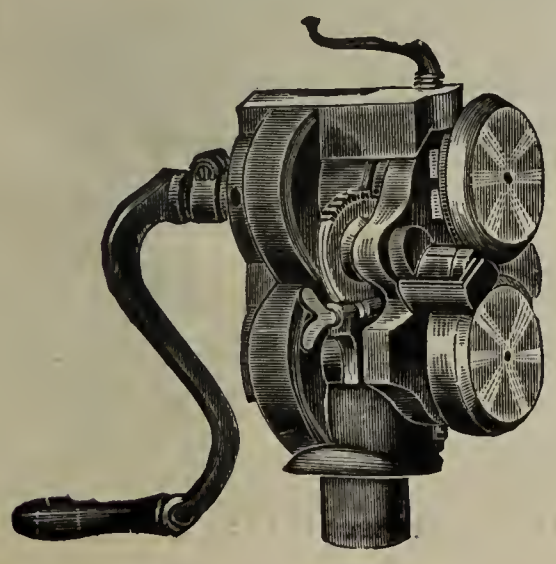
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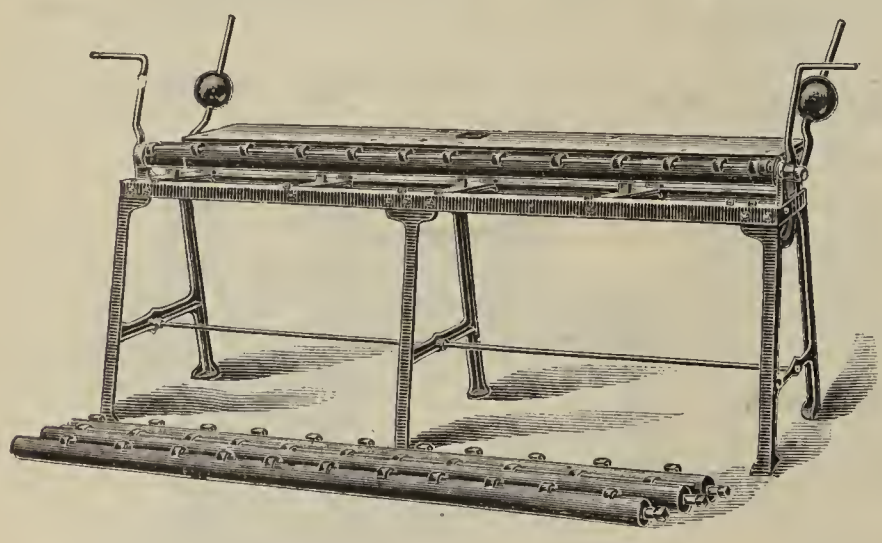
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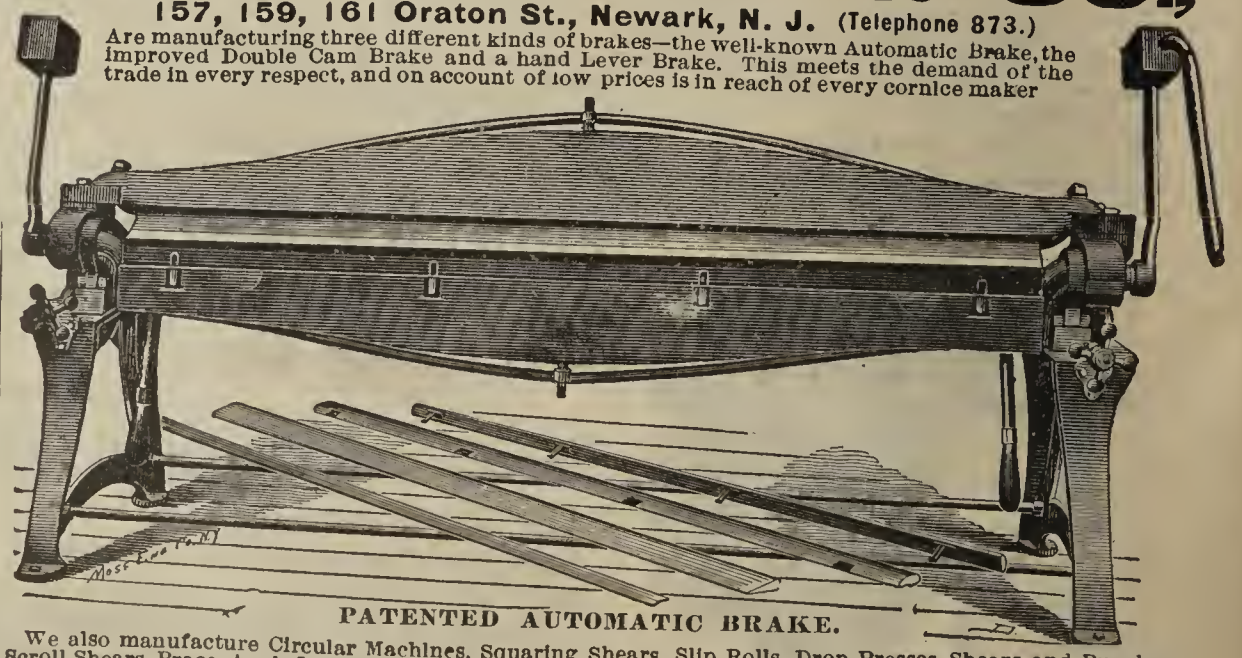
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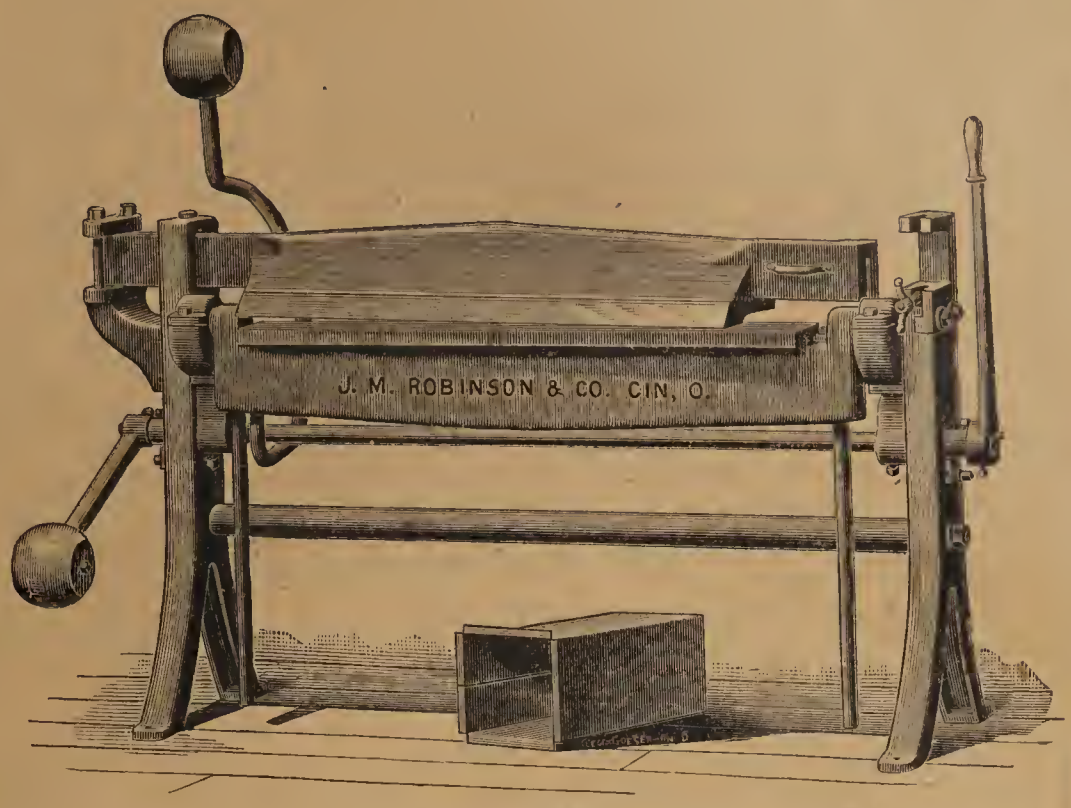
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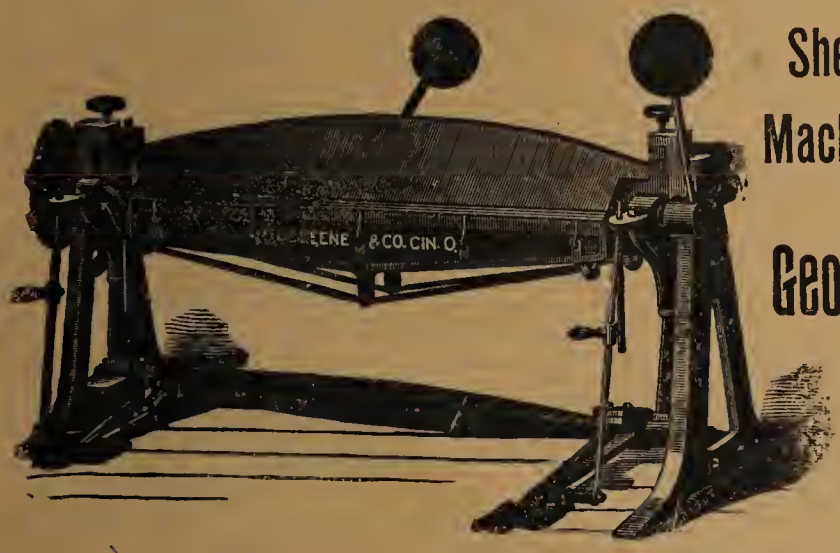
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